

Doctoral School in Medical Sciences

Manuscript title
C.Z.U: 355.415.6(043.2)

CÎRLAN Sergiu

CONTEMPORARY ARGUMENTATION OF MEDICAL SUPPORT IN OPERATION

331.03 – Social Medicine and Managment

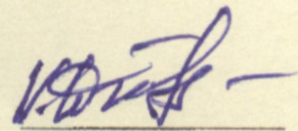
Summary of Ph.D. Thesis in Medical Cciences

Chisinau, 2023

The thesis was developed within the Department of Military Medicine and Disasters, "Nicolae Testimțanu" State University of Medicine and Pharmacy.

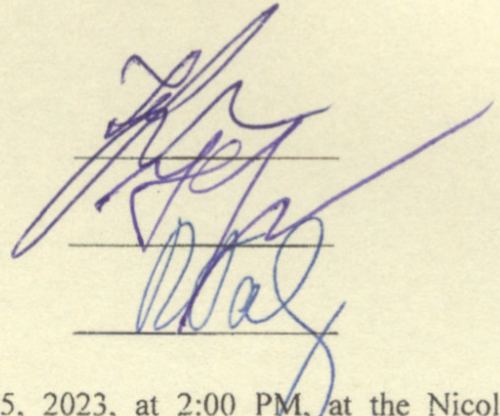
Scientific coordinator:

DUMITRAȘ Vasile,
MD, Ph.D. associate profesor



Thesis Advisory Committee Members:

SPINEI Larisa,
Ph.D. university profesor.
CHIMERCIUC Nicolai,
Ph.D. associate profesor.
TARGON Roman,
MD, Ph.D.

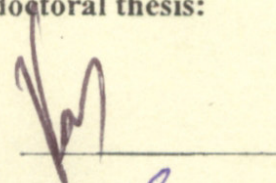


Ph.D. thesis defense will take place on November 15, 2023, at 2:00 PM, at the Nicolae Testemitanu State University of Medicine and Pharmacy, located at 165, Ștefan cel Mare și Sfânt Boulevard, Office 205, at the meeting of Commission for public Defense of Ph.D. thesis, approved by the decision of the Scientific Council of the Consortium Minutes No. 18 from 28.06.2023

The composition of the Commission for public defense of the doctoral thesis:

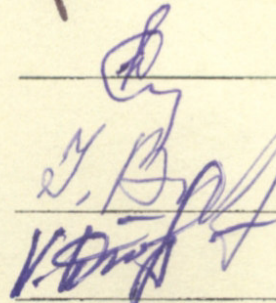
President:

CAPROȘ Nicolae,
MD, Ph.D. university profesor.
BULGAC Anatolie,
MD, Ph.D. associate profesor.



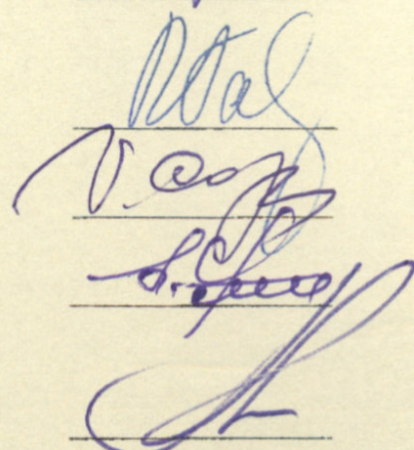
Members:

BAHNAREL Ion,
MD, Ph.D. university profesor
DUMITRAȘ Vasile
MD, Ph.D. associate profesor.



Official references:

TARGON Roman,
MD, Ph.D.
COJOCARU Victor,
MD, Ph.D. university profesor
CIUBARA Iurii,
Ph.D.



Author:

CÎRLAN Sergiu

CONTENT

	pag.
CONCEPTUAL LANDMARKS OF THE RESEARCH	4
1. MODERN CONCEPTS OF MEDICAL SUPPORT FOR FORCES IN CONTEMPORARY MILITARY CONFLICTS	7
<i>1.1 Concept of medical support for Armed Forces in the Russian Federation</i>	7
<i>1.2 The Concept of Medical Support for the Military Forces of NATO Member Countries</i>	9
<i>1.3 The Concept of Medical Support for the United States Military Forces</i>	12
<i>1.4. Medical Support for United Nations Peacekeeping Operations</i>	13
2. MATERIALS AND RESEARCH METHODS	16
<i>2.1 Research Design</i>	16
<i>2.2 General Description of Materials</i>	17
3. MEDICAL SUPPORT IN OPERATION: ESSENCE, PURPOSE, COMPONENTS	18
<i>3.1 Leadership of Medical Support in Operations</i>	19
<i>3.2 Planning of Medical Support at the Strategic and Operational Levels during the Preparation for Combat Actions</i>	19
<i>3.3 Medical Support Levels</i>	23
4. Medical Support at the Tactical Level	26
<i>4.1 Leadership of Tactical-Level Medical Support</i>	26
<i>4.2 Allocation of Forces and Means of the Medical Service at the Tactical Level</i>	27
<i>4.3 Medical evacuation</i>	35
GENERAL CONCLUSIONS	36
PRACTICAL RECOMMENDATIONS	36
BIBLIOGRAPHY	36
ANEXE	38
<i>Anexa nr.1 Triage card</i>	38
<i>Anexa nr.2 Minimum equipment required for ambulances</i>	41
<i>Anexa nr.3 9 lines request</i>	42
<i>Anexa nr.4 The basic scheme of the Battalion aid station.</i>	44
<i>Anexa nr.5 The minimum equipment of Battalion aid station</i>	46
<i>Anexa nr.6 The principle scheme of the Role 1 medical treatment facilities/medical detachment</i>	47
LIST OF PUBLICATIONS AND PARTICIPATION IN SCIENTIFIC FORUMS	53
DECLARATION ON ACCOUNTABILITY	56

CONCEPTUAL LANDMARKS OF THE RESERRCH

In the research process, materials with content designated as state secret, as well as with a classified character, have been used.

The military conflict remains a global issue. The World War II, which took place between 1939 and 1945, resulted in massive human and material losses. Approximately 50 million deaths were recorded, with around 70% being civilian casualties. Since September 1945, there have been approximately 200 military conflicts worldwide, resulting in approximately 10.5 million deaths [1]. Currently, there are 43 active conflicts [2]. Contemporary military conflict is characterized by:

1) Conducting combat actions with forces and means in accordance with peacetime structure (or partial mobilization).

2) Minimal localization of the operational area.

3) The absence of a fixed duration for conducting combat actions, ranging from 6 days (the Arab-Israeli conflict in 1967) to 8 years (the Iran-Iraq conflict, 1980-1988).

4) The intensity of combat actions during the conflict varies cyclically, with force and means accumulating for up to 6 months and direct combat actions lasting up to 7 days.

5) The civilian population of the warring parties is exposed to the risk of harm from warring factors, resulting in collateral losses [4].

Armed conflicts in the last 30 years have seen new trends and diverse situations in the preparation and conduct of combat actions, leading to changes in military strategies. Advanced new technologies have radically changed the means and methods of conducting combat actions. Most contemporary military conflicts can be characterized by the concept of Fourth-Generation Warfare: insurgency and terrorism [3]. This concept posits that combat actions occur between state forces on one side and non-state structures on the other. Legal military forces attempt to establish constitutional order throughout the state's territory, but illegal military forces, in most cases, succeed in destabilizing and discrediting the state through propaganda and terrorist acts.

One type of conflict within this concept is "hybrid warfare," which combines civil wars, guerrilla warfare, and terrorism, with a predominant emphasis on criminal behavior on the battlefield. Hybrid warfare is not conducted solely with a military or political strategy but rather with a hybrid strategy.

The hybrid nature of military actions in contemporary conflicts has the following aspects [4]:

1) The use of unconventional means and methods to achieve goals.

2) Diverse interests (economic, political, religious, etc.).

3) Willingness to take risks that may be morally or legally restrictive for opponents.

4) Different value systems (e.g., "martyrdom").

5) Organizational flexibility.

6) Undermining the adversary's strengths using radically different methods than expected.

Contemporary military conflict can be characterized as a combination of different ways of conducting combat actions, using both conventional and unconventional weapons, regular and irregular forces, terrorist actions, and organized criminal activities, resulting in indiscriminate violence beyond international law [4].

In the 1970s and 1980s, the reduced trend of using "nuclear" weapons in armed conflict led to the development of powerful "conventional" weapons with reduced ecological damage but high destructive power. Currently, in addition to their "conventional" payloads, missiles, aerial bombs, and mines are loaded with additional explosive materials, known as "tandem," which

have a strong mechanical and thermobaric effect and cause a "cascading detonation." The use of such weapons, which are not officially considered "mass destruction weapons," significantly increases the severity of injuries.

In most contemporary military conflicts with ongoing military operations, tactical groups consisting of 1-2 battalions up to a brigade are typically used to conduct independent combat actions. The use of explosive objects during military conflicts has changed significantly, with a considerable increase in the number of improvised explosive objects. During the military conflict in Afghanistan (2001-2014), the number of injuries resulting from explosions reached approximately 69% of the total number of casualties in 2011 [5].

Recent experience in medical support in operations indicates that the organization and provision of medical assistance in local military conflicts differ from the principles of medical support in major military conflicts.

All of these actions take place against the backdrop of an escalating geopolitical situation in the region (the military conflict in Georgia in 2008, events in southeastern Ukraine). The situation calls for the efficient organization and deployment of medical support for military forces and careful regulation in operations.

The need to evaluate existing medical support in the National Army is largely conditioned by the ongoing reform of the National Army. It is worth noting that in the Republic of Moldova, no study has been conducted to substantiate tactical-level medical support for forces in contemporary military conflicts based on modern principles.

Purpose: Evaluating contemporary experience for planning medical care in military conflicts in order to develop recommendation for strengthening medical support at the tactical level of operations in the National Army.

Objectives:

- 1) Studying modern concepts of medical support for forces in contemporary military conflicts.
- 2) Studying and analyzing existing documents in the National Army of the Republic of Moldova that regulate the conduct of operations and medical support.
- 3) Analyzing the geopolitical, physical-geographic, and medical-geographic factors of the regional theater of operations and their impact on medical service activities.
- 4) Evaluating treatment and evacuation measures, sanitary-hygienic, anti-epidemic and force protection measures against the effects of modern weapons, as well as leadership elements through simulation exercises.
- 5) Developing recommendations for optimizing the concept of medical support at the tactical level of operations in the National Army.

Scientific Novelty: A comprehensive study was conducted by synthesizing bibliographic sources related to contemporary military conflicts and medical support for military forces in NATO member countries, including the USA and Russia. Normative acts in the Republic of Moldova related to state defense and medical support for troops were examined.

Additionally, the capabilities of the National Army's medical treatment facilities measures were assessed and compared with those of NATO countries, the USA, and Russia. As part of the combat regulations, a manual on force medical support was developed, along with recommendations for optimizing the concept of force medical support.

The research results have contributed to addressing an important scientific problem by providing a scientific and methodological foundation for medical support in tactical operations in the National Army.

The practical value of the work includes:

1) Approval and implementation, by Ministerial Order No. 619/2019, of the Manual on Medical Support in Operations.

2) Approval and implementation, by Ministerial Order No. xx/2020, of the Rules for provisioning, maintenance, and echeloning of reserves of medical-sanitary means in the Armed Forces of the Republic of Moldova.

3) Approval and implementation, by Ministerial Order No. xx/2020, of the Rules for tabulating medical equipment, apparatus, and material goods in the Armed Forces of the Republic of Moldova.

4) The research results are used in the development of the Capability Development Plan for the Medical Service for the period 2020-2030, which is a component of the National Army's Military Capability Development Plan.

5) The study data has been used in the adjustment of the organizational structure of the medical service of the National Army.

At the research project approval stage, positive ethical approval was obtained from the Research Ethics Committee for the study, No. 4 dated 09.11.2016.

Scientific Research Methodology: The work is based on secondary epidemiological research (synthesis of bibliographic sources) and a cross-sectional study conducted in five stages. The organization of the medical support system for forces during armed conflicts in the past 25 years in the regional theater of operations was analyzed. The analysis of the concepts of medical support in operations of the Armed Forces of the Russian Federation, NATO member countries, the United States, and international peacekeeping operations, primarily focused on the study of tactical-level medical support (battalion-level task group).

Results Approval: The research results were reported and discussed at the following scientific conferences: Annual Scientific Conference of the "Nicolae Testemițanu" State University of Medicine and Pharmacy (Chișinău, 2017, 2018, 2019, 2022), Health, Medicine, and Bioethics in Contemporary Society: Inter and Multidisciplinary Studies (Chișinău, 2020), Republic of Moldova in the Context of the New Regional Security Architecture (Chișinău, 2023), Eurasia Africa Military Medical Summit & European African Military Nursing Exchange (Garmisch, 2016, 2017).

The thesis was discussed and approved at the meeting of the Department of Military Medicine and Disaster Medicine of the "Nicolae Testemițanu" State University of Medicine and Pharmacy on 28.10.2020 (Minutes No. 4).

Thesis Publications: The research results were reflected in 13 scientific works, including one manual, 3 articles, and 9 theses.

Thesis Volume and Structure: The work comprises 80 pages, structured traditionally: introduction, 4 chapters, conclusions, bibliography with 110 sources, 8 annexes, 14 tables, and 5 figures.

Keywords: military conflict, tactical force, medical support, hybrid warfare, medical care echeloning, medical evacuation, medical treatment facility, battalion aid station.

THESIS CONTENT

CONCEPTUAL LANDMARKS OF THE RESEARCH

In the introduction, the relevance of the addressed problem is presented, and the significance of scientific research is demonstrated. The research purpose and objectives are formulated. The scientific novelty, the solved scientific problem, and the implementation of the obtained results are also explained.

1. MODERN CONCEPTS OF MEDICAL SUPPORT FOR FORCES IN CONTEMPORARY MILITARY CONFLICTS

1.1 Concept of medical support for Armed Forces in the Russian Federation. Contemporary specialized literature mentions that combat actions during military conflicts in the North Caucasus have been characterized by high intensity and mobility, leading to the formation of battalion-level tactical groups [6]. Simultaneously, the concept of medical support has been adjusted in line with changes in the conduct of combat operations, with the primary objective being the provision of medical assistance closer to the battlefield.

The Medical Treatment Facilities (MTF) were distributed across three levels:

Level 1 – providing medical care in the field of battle. Medical support at the battalion level includes first aid and pre-medical care. Special attention was given to training the personnel within the tactical group in medical training, particularly in providing first aid. During the first military conflict (1996-1999), the overall provision of self-help and mutual care was at 28.6%, and it increased to 73.4% in the second military conflict [6].

Non-medical personnel were appointed to the positions of medical instructors in the subunits. Specialized training was conducted at specially designed training centers with course duration of 6 months.

At the beginning of the first military conflict, a deficiency of medical personnel with medical college education (PA) was identified in the Battalion aid station (BAS). The decision was made to reinforce BAS with medical teams composed of a doctor, a PA and 4 sanitary instructors. 3 armored vehicles and an ambulance were allocated for the evacuation of the wounded.

Level 2 – medical care provided at the regimental (first medical care) and division (qualified medical care) levels. Providing initial medical care in the pre-hospital stage is considered a fundamental element in preparing the wounded for subsequent evacuation.

The quality of medical care was improved by appointing doctors to positions in the MTF of the regiment after their specialized training in surgery or anesthesiology basic training.

Additionally, the MTF was reinforced with a surgeon and an anesthesiologist from the Independent medical battalion. Starting from 1997, the organization of infantry regiments included a medical company consisting of 2 surgeons, an anesthesiologist, a therapist, a psycho-neurologist, and an officer responsible for medical support planning.

Helicopters were more frequently used for evacuating the wounded from the regimental MTF.

Qualified medical care was provided at the Independent medical battalion. Since 1996, a concept introduced by E. Gumanenco, "*Early Specialized Surgical Assistance*," based on the medical air evacuation of the wounded from medical formations directly to joint military hospitals, was implemented. This approach was applied to 30% of the wounded during the first military conflict and 55% during the second.

Level 3 – specialized surgical care. This level was also divided into 3 stages:

Stage 1 – includes garrison mixed hospitals located in the North Caucasus District. At this stage, surgical interventions (urgent and delayed) aimed at stabilizing and maintaining the vital functions of the wounded, preventing complications, and preparing for further evacuation were carried out. Military hospitals were reinforced with specialists from the Military Medical Academy "S. Kirov," Central Military Clinical Hospitals "N. Burdenko," and "A. Vishnevsky." After stabilizing vital functions within 2-3 days, the wounded were evacuated to the next stage with the support of medical aircraft.

Stage 2 – includes military hospitals located near the North Caucasus District (Rostov-on-Don, Volgograd, Krasnodar, Samara, Ekaterinburg). At this stage, specialized surgical assistance was provided in full volume, including neurosurgery, thoraco-abdominal surgery, and traumatology. In a limited volume, angiosurgical and combustiology assistance was provided. Military hospitals in Budionnovsk, Stavropol, and Novocerkask were designated for lightly injured patients.

During the conflict in the years 1999-2002, a total of 58,194 surgically profiled injured individuals were treated, and 24,289 surgical interventions were performed. 91% of the total number of injured individuals who were admitted to military hospitals at level 2 were evacuated within the first 5 days after being wounded. A significant portion of the injured was evacuated from joint military hospitals: 82.8% during the conflict in 1994-1996 and 95.6% during the conflict in 1999-2002. The rest of the injured were evacuated from Independent medical battalions [7].

Stage 3 – includes Central Military Clinical Hospitals "N. Burdenko," "A. Vishnevsky," No. 32, 4, 6, and the Military Medical Academy "S. Kirov." The evacuation of the wounded at this stage was carried out with the support of the medical aircraft IL-76 "Scalpel," assisted by a medical team composed of a reanimatologist and a PA. Up to 30 wounded individuals were evacuated on each flight.

In the first military conflict, the duration of the evacuation of the wounded from levels 1 and 2 was 4-5 hours for 57% of all wounded and 6-14 hours for the rest. In the second conflict, the evacuation time was reduced to 3.5 hours. The duration of time required for transporting the wounded from the aircraft and subsequent transportation to the military hospital was approximately 2 hours. A medical team was created at the airport for receiving, triaging and accompanying the wounded, consisting of 8 surgeons, a reanimatologist, a medical coordinator, 2 PA and 2 nurses.

The military conflict in Georgia took place from 7 to 12 August, 2008, and it represented an armed conflict between Georgia on one side and the Russian Federation on the other. The Russian Federation's involvement in the conflict included the 58th Army, supported by Airborne Forces, the Air Force, and military vessels from the Black Sea Fleet.

Prior to the start of the military conflict, the regions of Abkhazia and South Ossetia had forces and means of the medical service organized according to the structure of supporting units and the forces and means allocated for reinforcement. For medical support of the force group, forces and means of the medical service from the North Caucasus Military District were designated.

Additionally, 3 special-purpose medical detachments were kept in reserve [8].

The distribution of specialized surgical assistance included 10 military hospitals allocated across three levels: zonal, regional, and central (20%, 53.3%, and 26.7%, respectively). At the beginning of the conflict, the medical service of the force group was reinforced with:

- 1) An independent medical battalion.
- 2) The medical team from the general military hospital and central military hospitals (for Military Hospital 236 in Vladikavkaz).
- 3) The team for specialized medical assistance from the Military Medical Academy "S. Kirov."
- 4) The special-purpose medical detachment 183.

During the military conflict, there was maneuvering of forces and means of the medical service: Medical Detachment 529 was directed towards Abkhazia, and Medical Detachment 183 towards South Ossetia.

Medical Detachment 259 was transported by rail to Vladikavkaz and subsequently marched along the route: Vladikavkaz – Alagir – Buron – Djava. On August 13, 2008, the detachment was deployed in the military camp in Tskhinvali, with the following functional subdivisions: admin, evacuation section, special treatment section, surgery and resuscitation section (in a container with variable volume), a hospitalization section with 105 beds (65 therapeutic profile beds and 40 surgical profile beds), a diagnostic and laboratory complex, a dental office based on "AP-2," and a pharmacy. From August 14 to August 26, 2008, within the detachment, 456 patients were treated on an outpatient basis (including 350 military personnel), 221 patients were hospitalized, and 136 were evacuated [9].

Medical Detachment 183 with a special purpose was transported by air from its permanent location (Ekaterinburg) to Adler Airport. Subsequently, they marched along the route: Adler – Ptsou – Gagra – Sukhumi. For the deployment of the detachment, the resources of military sanatoriums were utilized, specifically, the military sanatorium in Sukhumi, located in a three-story building. Additionally, a "self-dressing room" was set up in the surgery section. From August 12 to August 28, 2008, outpatient medical assistance was provided to 115 patients (including 104 military personnel), 32 patients were hospitalized, and 25 were evacuated [7].

Evacuation from the Operational area was carried out with the support of helicopters, ambulances, general transportation, and armored vehicles. The main flow of patients was directed to Military Hospital 236 (Vladikavkaz), accounting for 71.2% of all patients, of which 80.7% were evacuated after receiving medical care: 13.1% to Military Hospital 331 (Budeanovsk), 61.3% to regional-level military hospitals, and 33% to central-level military hospitals [8].

1.2 The Concept of Medical Support for the Military Forces of NATO Member Countries. The study of publications and open-access documents, international conference materials, as well as courses, has enabled the identification of certain aspects of the concept of medical support for the military forces of NATO member countries.

From 2001 to the present, NATO has conducted a series of operations with varying characteristics.

On October 7, 2001, the military conflict in Afghanistan commenced with "Operation Enduring Freedom" (2001-2014), conducted by the US Armed Forces in conjunction with the British Army, in response to the September 11, 2001 attacks on the United States. The objective was to remove the Taliban regime from Kabul, which closely collaborated with international terrorism and Osama bin Laden. In December 2001, NATO initiated a security mission known as ISAF (2001-2014).

In January 2015, NATO launched the "Resolute Support (RSM)" mission in Afghanistan, aimed at training, advising, and assisting Afghan national forces.

In the Western Balkans, NATO carried out peacekeeping operations in Kosovo (KFOR) since 1999.

Since July 2016, NATO transferred the "Active Endeavour" operation to the "Sea Guardian (OSG)" operation to counter a broader range of security threats in the maritime domain, particularly in the Mediterranean region.

NATO's doctrine for medical support in operations, known as "AJP 4.10 Allied Joint Doctrine for Medical Support," continuously adapts to contemporary conditions. The latest version, "C," was approved in September 2019 [10]. This doctrine governs medical support in various types of operations, including major military conflicts, stability operations, peacekeeping operations, and disaster response missions. From a command and control perspective, medical support is organized, planned, and led at 3 levels of structures with expertise in the field, ensuring:

1) Strategic level: the establishment of general principles for organization and operation, the definition of action directions in the field addressed, and the identification of necessary resources.

2) Operational level: the planning and coordination of measures and specific procedures related to the medical support concept and the supply of medical material goods to medical units at the tactical level.

3) Tactical level: Role 1 and 2 MTFs implement measures based on the operation plan or action order to efficiently provide medical protection to the forces.

The doctrine for medical support is based on several types of medical care provided to the wounded: self-care or buddy care, primary medical care, secondary medical care, and definitive medical care. Self-care or buddy care includes all health care measures without involving medical personnel, such as personal hygiene, promoting a healthy lifestyle, and providing first aid in case of injury.

Primary medical care is provided or supervised by medical personnel and includes initial diagnosis and treatment of injuries and illnesses, management of patients with minor issues to enable a swift return to duty, continuous medical care, health promotion, and patient counseling. Secondary medical care includes specialized clinical diagnosis and treatment, particularly:

1) Emergency surgical care: surgical procedures performed to stabilize the wounded for life-saving purposes.

2) Procedures aimed at preparing the wounded for strategic evacuation (STRATEVAC).

3) Essential clinical functions designed to enhance specialized care according to mission requirements and reduce the need for repatriation of military personnel.

Definitive medical care represents the final stage of the medical care cycle. It involves restoring mental and physical capacity to the highest possible level, enabling patients to return to military service or be discharged from military service due to illness.

The treatment system and the evacuation of the wounded are based on the recognized time interval imperative of "10-1-2(+2)" [10]:

- "10" – controlling airways and providing provisional hemostasis within 10 minutes of the injury.

- "1" – evacuating to the medical unit with capabilities for resuscitation and stabilization of vital functions.

- "2" – evacuating to the medical unit providing emergency surgical care (Damage Control Surgery and Resuscitation) within 2 hours of the injury.

- "+2" – conducting surgical intervention, stabilizing vital functions, and directing diagnosis for preparing the wounded for strategic evacuation (STRATEVAC) within 4 hours of the injury.

The forces and means of the medical service are distributed across 4 evacuation stages (Roles) defined by the minimum clinical and paraclinical capacities available.

Capabilities refer to "what the medical unit can do" based on its duties, competencies, and equipment.

Role 1 MTF (R1) provides the following capabilities:

- 1) Primary medical care.
- 2) Provision of public health elements.
- 3) May include minimal capacities for temporary care of the wounded.
- 4) Primary dental care.
- 5) Laboratory for a minimum of analyses.
- 6) Specialized personnel in combat stress management.

Role 2 MTF (R2) is capable of both receiving and triaging the wounded, as well as providing resuscitation and treatment for traumatic shock at a high level.

There are several types of Role 2 units:

1) Role 2 Forward (R2F) – the advanced medical unit with high mobility and the following capabilities: advanced emergency surgery, postoperative care, and preparing the wounded for further evacuation. Resources for this unit are limited.

2) Role 2 Basic (R2B) – the mobile medical unit with capabilities for receiving, triage, resuscitation, and emergency surgery, as well as postoperative care. There are limitations in the hospitalization of the wounded and medical supply. This unit can be deployed to enhance the provision of medical assistance in the theater of operations.

Role 2 Enhanced (R2E) – the reinforced medical unit with diagnostic capabilities, specialized medical care, and preparation of the wounded for strategic evacuation (STRATEVAC). It includes radiological investigations, laboratory testing, a blood bank, a pharmacy, and sterilization facilities.

Role 3 MTF (R3) encompasses a set of specialized medical care capabilities, computerized tomography, and oxygen production. R3 capabilities reduce the need for repatriation of the wounded and provide high-level medical assistance before strategic evacuation.

Role 4 MTF (R4) includes the full spectrum of medical specialties, diagnostics, and medical procedures. This is the medical unit that operates on national territory in a permanent location [10].

Medical evacuation represents the assisted and specialized transport of the wounded/sick to medical evacuation stages (Role 1) or to higher-level medical units with diagnostic and therapeutic capabilities, using ground or air technical means. Medical evacuation consists of three phases:

1) Advanced Medical Evacuation: Ensures the retrieval of the wounded from the incident site to the medical unit.

2) Tactical Medical Evacuation: Provides the transport of the wounded between medical units at different levels within the same theater of operations.

3) Strategic Medical Evacuation: Ensures the transport of the wounded out of the theater of operations, usually to a Role 4 medical unit [10].

There are three priority categories for evacuation:

- Category A – Urgent: Evacuation as soon as possible (from 1 to 2 hours after injury).
- Category B – Other cases (on a stretcher), maximum 4 hours after injury.
- Category C – Evacuation can be postponed for up to 24 hours.

Medical evacuation within the theater of operations by air is based on the "90-minute standard." To achieve evacuation from the site of injury to surgery (within 2 hours), the time from receiving the evacuation request ("9-line") to the arrival of the helicopter at the destination medical unit should be less than 90 minutes [11].

1.3 The Concept of Medical Support for the United States Military Forces.

Following the study of publications, course materials, in which I participated, as well as materials obtained during working visits through the exchange of experience, it was observed that this concept envisages five levels of staging the system of treatment and evacuation of the wounded, as presented in Table 1 [13].

Table 1. Level of Medical Support

Role V	Role IV	Role III	Role II	Role I		
(CONUS)	Outside the Theater of operational	Army Corps	Brigade (MedCoe)	Battalion (BAS)	Company (CCP)	Point of Injury
Combined Treatment	Definitive Medical Care	Surgical Care: General, Orthopedic, Urologic, Thoracic, Gynecological, Neurosurgical, Oro-Maxillo-Facial	Surgical Patient Stabilization Management for Life or Limb Saving	Stabilization of Vital Functions/Initial Medical first care	Pre-Medical care	First Aid
Military hospital dislocated on continental part of the USA	Military hospital (Germany)	Combat Support Hospital	Surgical team	doctor; PA	combat medic	Self-help, CLS

In the Air Force, there is a medical unit called 'Expeditionary Medical Support (EMEDS).' This modular unit is in permanent readiness and is intended for deployment in military operations, peacekeeping operations, and disaster relief missions of various kinds. There are three types of EMEDS units. The medical-tactical characteristics are presented in Table 2.

Table 2. **Medical-tactical characteristics of EMEDS**

	EMEDS Basic	EMEDS +10	EMEDS +25
Personnal at risk	500-2000	2000-3000	3000-5000
Livel	Livel 2		Level 3
Badts	4	10	25
Efectiv	25	56	85
Logistic support	7 days		
Capability	10 minor surgery/ resuscitations	10 major surgery/ resuscitations	20 major surgery/ resuscitations
Transportation	1 C-130 (3 palets)	1 C-17 (14 palets)	3 C-17s (55 palets)

A Role 4 medical unit is a formation that provides definitive medical care outside the theater of operations or in the communication zone, primarily focusing on patient rehabilitation or special needs.

These units are represented by the combat support hospital higher than the corps and the Landstuhl Army Medical Centre [15].

The military hospitals within the Department of Defense and the Department of Veterans Affairs are located on the continental part of the USA (CONUS) and provide Role 5 medical care through combined treatment: surgical, rehabilitation, and convalescent care [15].

1.4 Medical Support for United Nations Peacekeeping Operations. Analysis of publications has revealed that the concept of medical support for United Nations peacekeeping operations is based on the following principles:

1) International Convention for the Treatment of the Sick and Wounded: Medical assistance for UN operations will comply with the Geneva Convention and its protocols, as well as the Laws of War as they pertain to medical units and personnel.

2) Right to Medical Assistance: All individuals have the right, based on their clinical needs and the availability of medical resources, to receive medical treatment without discrimination.

3) Medical Support Standards: Medical assistance for UN personnel must adhere to standards acceptable to all participating nations. The objective is to provide a standard of medical care comparable to peacetime medical care, predominantly.

4) Timely Medical Assistance: Medical support for a UN peacekeeping force must maintain a high state of readiness and availability, offering timely, responsive, and continuous medical assistance to any patient or casualty within the medical system [17].

United Nations peacekeeping operations are characterized by certain features that fundamentally impact medical provision:

1) Political Complexity and Dynamic Nature: UN peacekeeping operations involve complex political dynamics and constantly changing circumstances.

2) Geographic, Demographic, Cultural, and Linguistic Diversity: The mission area often presents geographic, demographic, cultural, and linguistic variations.

3) Epidemiological Situation: The health conditions and disease prevalence in the mission area play a crucial role.

4) Multinational Forces: UN peacekeeping forces consist of troops from multiple nations, each with different national training standards and operational procedures.

There is a clear chain of command in UN Peacekeeping Forces, with the highest medical officer in the mission being the Force Medical Officer (FMO), directly subordinate to the Force Commander (FC) or designated Mission Chief. The FMO acts on behalf of the commanding officer in all medical matters and supervises all UN medical units. Additionally, the FMO oversees medical units attached to national contingents, which remain under the command of their respective unit commanders. Similarly, the FMO supervises the Medical Service Division (MSD) and the Medical Support Section (MSS) of the United Nations concerning policy and operational matters.

Two structures are involved in providing medical support to UN personnel in peacekeeping operations:

- 1) The Medical Service Division, responsible for developing and promulgating medical policies regarding the medical care of personnel engaged in UN peacekeeping missions.

- 2) The Medical Support Section (MSS) of the Field Support Department, which serves as the executive branch of the United Nations for planning, coordinating, and monitoring field medical assistance.

There is a close and mutually professional working relationship between the two, each with clearly defined terms of reference.

To ensure the highest standards of medical support, standardized levels of medical care have been established:

Level 0: Provides basic first aid and preventive medicine at the lowest level by trained medical instructors/paramedics. It is a national responsibility.

Level 1: Available with two doctors and six medics/instructors. Provides frontline primary medical care, resuscitation, stabilization, and evacuation of casualties to the next level of medical care in a UN peacekeeping mission. Level 1 is a medical unit with medical supplies for up to 60 days. It is a national responsibility.

Level 2: The next level of medical care and the first level where surgical facilities are available. The mission of a Level 2 medical unit is to provide second-line medical care, resuscitation, stabilization, limb-saving surgeries, dental care, and evacuation to the next echelon.

Level 3: The highest level of medical care formation. It combines the capabilities of Level 1 and Level 2 medical units with the additional capacity to provide specialized treatment, surgical interventions, and extensive diagnostics. It's important to note that a Level 3 formation is rarely deployed, and this level of support is typically obtained from existing civilian or military hospitals in the mission area or in a neighboring country.

Level 4: A medical formation that provides definitive medical care and specialized treatment that is either unavailable or impractical in a mission area. This includes specialized surgical procedures, reconstruction, rehabilitation, and convalescence. Treatment is highly specialized and costly and may be of long duration. It is neither practical nor cost-effective for the UN to deploy a Level 4 formation in the mission area. Assistance may be provided in the host country, a neighboring country, or national medical institutions. The UN may arrange patient transfers to a Level 4 formation, and for cost, reimbursement, and pension reasons, continue to monitor the patient's progress [17].

Indications for UN medical personnel to utilize Level 4 include:

- 1) Then the distance from the mission area to the home country is too far, and the patient urgently needs specialized medical treatment.

2) When the patient only requires short-term treatment and plans to return to mission duties within 30 days.

3) When the contributing country's troops are capable of providing adequate definitive treatment.

4) When the UN receives an offer from a specific nation to provide definitive care.

Providing medical services to the local population is a sensitive issue and must consider humanitarian principles and the ethical code of medical practice. Officially, the UN policy is that there is no obligation to provide or assume responsibility for medical services for the local population unless it is within the mission's mandate. However, emergency medical assistance must always be provided regardless of the individual or party, but the patient should be transferred to a local medical facility or an NGO as soon as possible. Such obligations, according to international law, also extend to prisoners of war, refugees, internally displaced persons (IDPs), detainees, and non-combatants under UN protection.

Public health is one of the most critical aspects of medical support. Significant results can be achieved with effective measures, resulting in reduced person-days lost, lower morbidity, reduced tariff rates, and lower treatment costs. Public health includes immunization, disease prevention, vector control, hygiene, and sanitation. Health hazards and occupational threats must be thoroughly assessed before deployment and as an ongoing process during operations. It should be emphasized that education to promote a healthy lifestyle and proper professional training is key to successfully implementing these measures.

Force Medical Officer is responsible for monitoring the health and epidemiological situation in the mission area and is guided by directives issued by the Medical Service Division and the Medical Support Section. He updates epidemiological data through contact with local health authorities and international agencies (e.g., WHO, ICRC) in the mission area. Additionally, he is responsible for collecting and analyzing medical statistics submitted monthly by medical units.

The Medical Service Division recommends vaccination and chemoprophylaxis requirements in a mission area, which must be adhered to by all contributing troops. These requirements are divided into mandatory (e.g., diphtheria, pertussis, tetanus, polio, typhoid, hepatitis B for medical personnel) and recommended (meningitis, rabies, hepatitis A, hepatitis B). The immunization regimen will vary based on the mission area.

The initial vaccination of the personnel and the associated costs are a national responsibility. The immunization status of each contingent member is documented for monitoring by medical personnel. In the case of a contingent deploying to a mission area without immunization, vaccines will be provided by supporting UN medical units, but all incurred costs will be reimbursed by the contributing country's troops.

Responsibility for planning and establishing an effective medical evacuation system falls on planning personnel in the Field Support Division and medical personnel in the mission area. The Force Medical Officer coordinates all evacuation activities. There are three categories of patients for evacuation:

1) Casualty Evacuation (CASEVAC): Evacuating a patient from the accident site to the nearest medical formation, ideally within one hour of the accident.

2) Medical Evacuation (MEDEVAC): Evacuating a patient between two medical formations, either within the mission area (in-theater) or out of it.

3) Medical Repatriation: Evacuating a patient to their home country for medical reasons when it is not possible for them to return to fulfilling their duties in the mission area.

Medical evacuation should be considered when local medical formations are not adequate for the required medical care.

Policies and procedures regarding MEDEVAC include:

- International recruits, civilian staff in the command, and military personnel can be evacuated with UN support if treatment is not available in the mission area. Locally recruited personnel, their spouses, and children can be evacuated in emergency situations when there is a high medical risk.

- In emergency situations, the contingent commander or force commander can authorize medical evacuation directly, following consultation with the Force Medical Officer and the Chief Administrative Officer (CAO). Prior approval by the UN Mission Headquarters is not required [17].

2. MATERIALS AND RESEARCH METHODS

2.1 Research Design. A secondary epidemiological study was conducted, relying on a narrative synthesis of bibliographic sources. The research consisted of five stages.

The first stage involved defining the problem. The need to evaluate the tactical-level medical support within the National Army, based on contemporary principles, and proposing ways to strengthen the provision of medical assistance at the tactical level was identified. This need was largely driven by the ongoing reform of the National Army.

The second stage focused on selecting the research group. The analysis was centered on how medical support is organized at the group-platoon-company-battalion level. It was based on the fact that in most contemporary military conflicts, tactical battalions are employed, which conducts independent combat actions.

The third stage involved selecting research methods. To achieve the research's purpose and objectives, historical, descriptive, comparative, biostatistical, and forecasting methods were used. A retrospective descriptive study of the evolution of the conduct of military actions by the Armed Forces of the Russian Federation, NATO member countries, the United States of America, as well as international UN peacekeeping operations over the past 25 years, was conducted.

Subsequently, changes in the organization of medical support for the aforementioned forces at the group-platoon-company-battalion level were studied according to new standards.

The fourth stage focused on data analysis. During this stage, the mission, organizational structure, and provision of medical equipment for medical units at the tactical level were analyzed.

The fifth and final stage involved drawing conclusions and making practical proposals. Based on the results of the aforementioned exercises, conclusions and proposals were developed for revising the existing concept of tactical-level medical support. As a result, in September 2019, the "Manual on Medical Support in Operations" was approved and implemented by the Ministry of Defense.

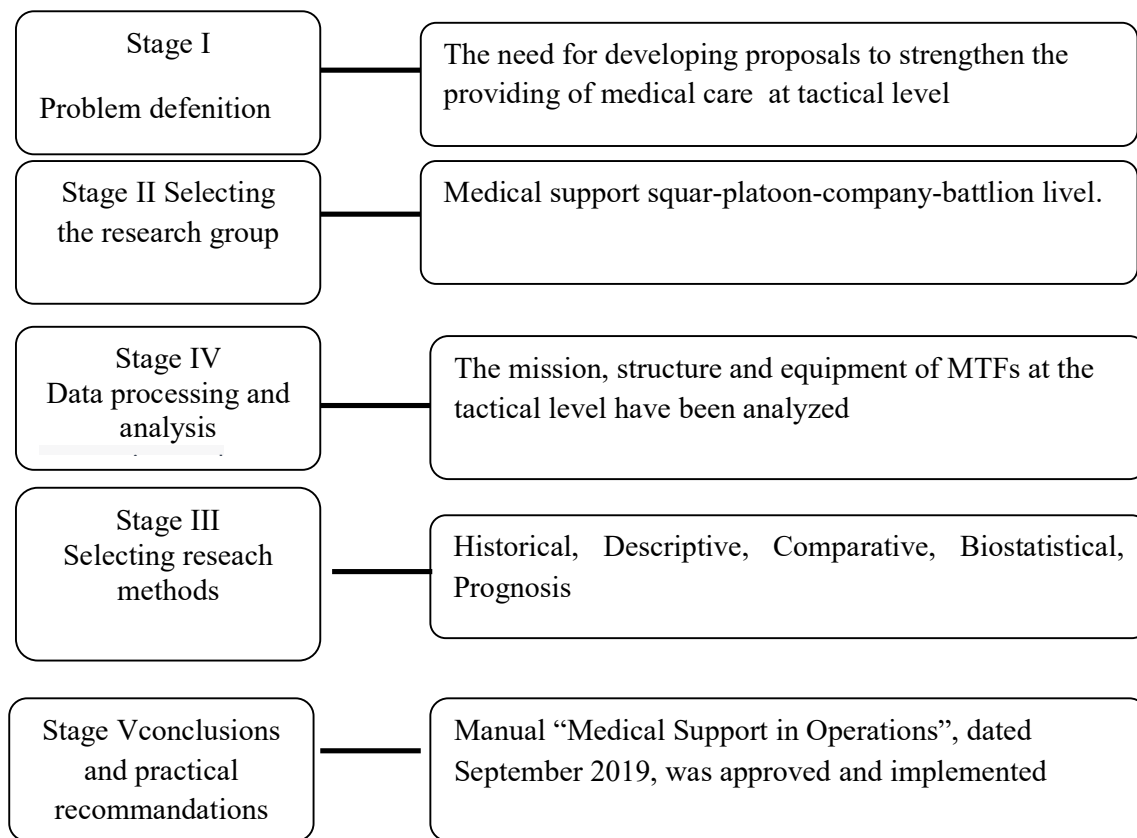


Figure 1. **Research Design**

2.2 General Description of Materials. All materials used in the research were categorized into 4 groups:

Group 1 includes the legal framework of the Republic of Moldova related to the Armed Forces:

- Constitution of the Republic of Moldova – adopted on July 29, 1994;
- Law No. 1244/2002 on the Reserve Forces of the Armed Forces;
- Law No. 1245/2002 on the Training of Citizens for Homeland Defense;
- Law No. 1192/2002 on Mobilization Preparation and Mobilization;
- Law No. 345/2003 on National Defense;
- Law No. 212/2004 on the Regime of State of Emergency, Siege, and War;
- Law No. 162/2005 on the Status of Military Personnel;
- Law No. 219/2015 on the Participation of the Republic of Moldova in International

Missions and Operations;

- Law No. 120/2017 on the Prevention and Combating of Terrorism;
- National Defense Strategy, approved by the Decision of the Parliament No. 134/2018;
- Military Strategy, approved by the Decision of the Government No. 961/2018.

Group 2 encompasses documents related to the National Army of the Republic of Moldova that regulate the conduct of operations and combat actions:

- Materials regulating medical support during operations within the National Army of the Republic of Moldova.

- Materials regulating the conduct of operations and combat actions within the forces of NATO member countries.

- Results of the "War Game" Exercises, medical section.

- Results of Staff Exercises, medical section.

- Results of the Moldovan-American simulation exercise "Falcon Medic - 2016."

Group 2 also consists of materials that regulate medical support during operations and combat actions in the Armed Forces of the Russian Federation, NATO member countries, the United States of America, and international UN peacekeeping operations. Some of these materials may be classified and include documents like MC 326/2 NATO Medical Support Principles and Policies, ACO Directive AD 83-1, AJP 4.10 Allied Joint Doctrine for Medical Support, Army Health System Support Planning, and the Medical Support Manual for United Nations Field Missions.

Group 3 contains materials from international conferences related to military medicine and materials obtained during working visits through the exchange of experience.

Group 4 includes leadership documents within the national healthcare system that regulate actions in response to exceptional situations.

- Order of the Minister of Health No. 133/2008 regarding the approval of the Nomenclature of Hospital Medical-Sanitary Institutions.

- Order of the Minister of Health No. 249/2010 regarding the approval of the National Guide on Medical Triage in incidents resulting in multiple casualties and disasters.

- Order of the Minister of Health No. 928/2011 regarding the coordination of measures for the preparation, response, and mitigation of the medical consequences of exceptional situations and public health emergencies.

- Order of the Minister of Health No. 528/2012 regarding the approval of the Guide for the development of the Training and Response Plan of the hospital in exceptional situations.

These documents govern the coordination of healthcare measures during exceptional situations and public health emergencies, such as the approval of hospital healthcare institution nomenclature and guidelines for medical triage in incidents resulting in multiple casualties and disasters.

These materials help govern interdepartmental interaction in medical emergency situations.

3. MEDICAL SUPPORT IN OPERATION: ESSENCE, PURPOSE, COMPONENTS

3.1 Leadership of Medical Support in Operations. The leadership of medical support in operations encompasses all the activities related to the organization and utilization of the resources and means of the medical service, with the aim of fulfilling specific missions in the operation. The leadership of medical support includes three basic elements:

1) Organizing and carrying out missions to enhance (maintain) the combat capability of medical units.

2) Collecting and analyzing the data necessary for planning medical support.

3) Decision-making, planning medical support, and assigning missions to subordinates.

The leadership of medical support in operations is divided into three levels:

Level 1 – Strategic. At this level, the plan for medical support of missions conducted by the Armed Forces is developed, necessary resources for the execution of medical service-specific missions are planned, and adjustments are made to the missions based on the situation.

Level 2 – Operational. Planning and coordination of the implementation of measures and procedures specified in the operational medical support plan, as well as the supply of medical materials to tactical-level MTFs, take place at this level.

Level 3 – Tactical. MTF carry out the measures established at the strategic and operational levels, based on the operation plan or action order, to efficiently provide medical protection for the forces (troops). Tactical-level leadership is carried out by the head of the medical service of the force group.

3.2 Planning of Medical Support at the Strategic and Operational Levels during the Preparation for Combat Actions. Planning is carried out continuously, first at the higher echelon, and then at the lower echelon. The planning of medical support unfolds in five stages.

Stage 1 – It initiates the establishment of requirements and needs that the planning must address and allows for a general orientation and boundaries for planning. Understanding the medical service mission involves grasping the task, purpose, and nature of actions in future combat, the task assigned to the medical service by the commander or higher authority, the conditions under which they are to be tackled, the duration of the medical service preparation period, and what needs special attention.

Stage 2 – Analyzes the mission and aims to identify factors and conditions that directly or indirectly affect the health of personnel and the sanitary-epidemiological situation, medical service activity, and the organization of medical support for forces/troops. The assessment of the situation is typically done in a certain order:

- 1) Strategic environment.
- 2) Geographic conditions.
- 3) Meteorological and hydrographic conditions.
- 4) Own and allied forces.
- 5) The adversary.
- 6) Chemical, biological, and radiological conditions.
- 7) The state of the health care system in the operational area and vicinity.

The strategic environment includes the influence of historical, political, economic, and social factors on the health care system in the operational area and vicinity, as well as the presence of non-governmental organizations (International Committee of the Red Cross, etc.).

Geographic conditions involve assessing the impact of terrain on the nature of future combat actions to determine:

- 1) Casualties estimation. Conditions for searching, collecting, and evacuating casualties from the battlefield.
- 2) Conditions for the deployment of MTFs and the evacuation routes for casualties.

The assessment of medical service forces and resources is conducted to determine their capabilities and the most useful way to utilize them. In their activities, the head of the medical service carries out certain calculations to comprehensively evaluate medical service forces and resources, justifying the necessity of certain activities and assistance from the commander and higher authority. The head of the medical service performs all calculations based on:

- 1) Casualties estimation (CE).
- 2) Knowledge of the availability and capabilities of medical forces and units.
- 3) Knowledge of specific standards.

Casualties estimation is a fundamental element in the medical support planning process, affecting the magnitude and distribution of resources that use statistical data from previous

operations, the accuracy of which is important. The results of the estimation are influenced by the expertise and military medical experience of the evaluator. In this study, various methods for estimating CE were analyzed.

At the strategic and operational-tactical levels in the Armed Forces of the Republic of Moldova, there is a particular interest in implementing the "Course of Action Development Tools" method used by the US Armed Forces in the medical support planning process. This method is an informational system that operates based on Excel spreadsheets (Figure 2). The method involves the analysis of nine basic factors for casualties estimating:

- 1) The number of personnel at risk.
- 2) Terrain (17 types).
- 3) Weather conditions (12 options).
- 4) Type of operation (8 options).
- 5) Rules of engagement (17 types).
- 6) The adversary (31 options).
- 7) Surprise (4 options).
- 8) Sophistication (15 options).
- 9) Operational situation (5 options).

In addition to estimating PSL, this method allows for the determination of the minimum medical-surgical materials and means needed for casualty evacuation.

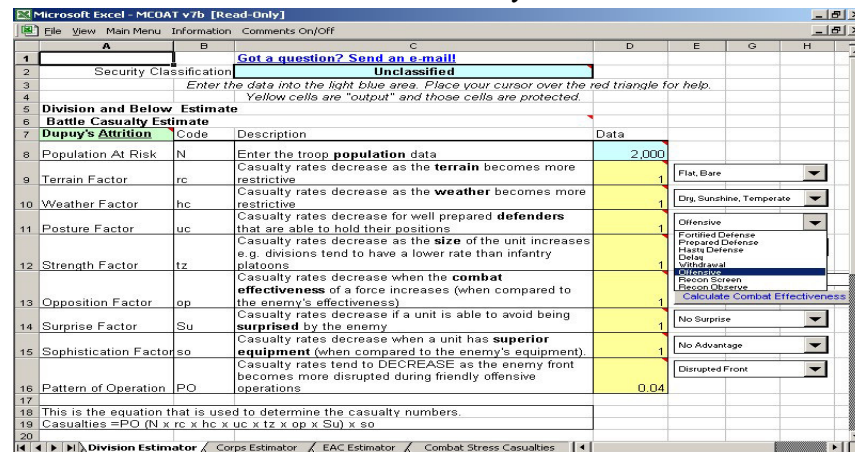


Figure 2. Casualties estimation using the "Course of Action Development Tools" method.

Another method is the "Logistical Estimation" calculation for medical compartments, which is also used in the US Armed Forces. One of the advantages of this method is the ability to determine PSL separately for combat forces and support and combat service support forces.

Estimating non-battle losses is a medical responsibility based on statistical analysis and takes into account environmental factors and occupational risks during the operation.

Following the analysis of the results of using the above-mentioned methods in the medical support planning process, it was found during the "War Game" Exercises and Staff Exercises that, in addition to personnel from the "Medical Support Cell," specialists from the current/future operations compartment and the personnel structure need to be included in the estimation of PSL.

An important role in the medical support planning process is played by the analysis of data on human sanitary losses in contemporary military conflicts. An important indicator in

describing sanitary losses in military conflict is the ratio of killed in action to wounded in action (Table 2).

Table 2. **Ratio of killed in action to wounded in action**

Ukraine	Georgia (2008)	Military conflict (1992)	Northern Caucasus	Afganistan (1979-1989)	Vietnam
<u>2014-2015</u> 1/3,5	1/ 4,7 (RF)	1/3,7 (total)	1/3	1/3	1/5
<u>2016</u> 1/5,1					
<u>2017</u> 1/7,3	1/8,3 (G)	1/5,4 (NA)			

The use of helicopters for medical evacuation significantly reduces the time for providing first aid on the battlefield, and consequently, sanitary losses are also reduced.

In the military conflicts in Afghanistan and Iraq (2001-2011), approximately 40% of the wounded were evacuated by air. The optimal time for aerial evacuation was revised from 120 minutes to 90 minutes from the moment of injury [14].

The structure of sanitary losses is related to the manner in which combat actions are conducted and the type of weaponry used (Table 3).

Table 3. **Structure of sanitary losses based on injuring factors and their mode of action**

Type of injury	Afganistan (1979-1989)	Northern Caucasus (1996-2001)	Afganistan, Irak (2001-2014)	Georgia (2008)
Firearm	62,3	58,9 / 57,2	59,2	42,2
Fracture	32,6	33,2 / 33,1	28,9	40,5
Burns	3,6	5,6 / 6,2	3,7	1,7
Combine	1,5	2,4 / 3,5	8,2	7,0

In the structure of sanitary losses, injuries from firearms predominate. There is a trend of decreasing the number of injuries from gunshot wounds.

In the military conflict in Georgia (2008), among the wounded from the Russian Armed Forces, their number did not exceed 6% [9].

Injuries resulting from munition explosions are prevalent. In the military conflict in eastern Ukraine, 80% of the total human losses were caused by the use of artillery [15].

In the North Caucasus military conflict, the warring parties extensively used flamethrowers. This led to a significant increase in the number of injuries with thermal burns (5.6-6.2%).

An analysis of sanitary losses in this conflict found that 20% of all the deceased could have survived if they had received timely assistance on the battlefield. From 20% to 40% of all deceased casualties on the battlefield died due to traumatic shock and hemorrhage. Up to 13% of the casualties who arrived at the regiment's medical point were in critical condition due to massive hemorrhages without the application of a hemostatic tourniquet, and 50% had bone fractures without immobilization [9].

In the military conflicts in Afghanistan and Iraq (2001-2014), there was an increase in the number of casualties with injuries from mine explosions (50-60%).

In the group of non-battle casualties (NBC), traumas caused by road accidents predominate (9-20%). Additionally, a predominance of NBC among conscript soldiers is observed (North Caucasus, Georgia) due to violations of safety procedures [8].

In contemporary military conflicts, the number of soldiers with combat stress disorders (CSD) has also increased. During the 1973 Arab-Israeli conflict, among 100 cases of sanitary losses, 40-50 were "psychological traumas." During the "Desert Storm" operation in 1991, this pathology was recorded in 30% of Iraqi soldiers. Approximately 20% of soldiers from the US Armed Forces evacuated from the theater of operations had psychological disorders.

The late consequences of this pathology are known as "Vietnam Syndrome," "Gulf Syndrome," and "Afghan Syndrome."

In the military conflict in Afghanistan (1979-1989), the North Caucasus, Georgia (2008), the structure of sanitary losses showed a ratio of officers / contract soldiers / conscript soldiers - 20% / 40% / 40% [9].

In the structure of sanitary losses, in all contemporary military conflicts, injuries to the extremities continue to predominate (Table 4).

Table 4. Frequency of sanitary losses by anatomical location (%)

Location	Vietnam (1961-1975)	Afganistan (1979-1989)	Northern Caucasus	Afganistan, Irak 2001-2014	Military conflict (1992)	Georgia (2008) (RF)
Head	14,0	12,4	32,8	21	32,2	25,4
Neck	1,7	2,0	1,1	-	-	0,8
Spine	1,4	2,0	1,1	1,6	-	-
Rig cage	12,0	11,2	6,2	4,0	10,6	6,5
Abdomen	10,9	10,6	7,8	6,0	9,1	5,8
Upper extremities	24,0	38,5	22,0	27,3	19,8	27,9
Lower extremities	36,0	36,6	39,8	29,8	28,9	33,6

It has been observed that equipping soldiers with protective vests has reduced the number of injuries to the chest and abdomen region to 4-6% (Afghanistan, Iraq 2001-2014).

Due to the actions of snipers in military conflicts, the number of head injuries has increased to 32.8% (North Caucasus).

The assessment of the state of the healthcare system in the operational area and its vicinity includes the study of the location and capacity of medical units present in the area and nearby.

Additionally, the location and capacity of medical units of non-governmental organizations, if present, are also studied.

Stage 3 involves developing the concept of how the mission should be accomplished, participating in the selection of the final course of action. It focuses on planning the medical support for the courses of action and drafting the concept of medical support for them.

Stage 4 involves the development of the medical support plan for the operation. The plan identifies the forces needed to implement the plan, organizes their deployment to the operational

area in a timely manner, and plans for their protection, training, and support. It also includes coordination with other commands and structures. The result is a plan approved by the higher echelon.

Stage 5 involves reviewing the plan. Plan review ensures its validity in terms of both the continuity of requirements, policies, and doctrines, as well as the feasibility, timeliness, and realism. It includes periodic plan review to identify any changes that may result in a new planning guide.

3.3 Medical Support Staging. Medical support includes all organized activities carried out at the subunit and medical unit level to save the lives of the wounded/sick, provide treatment and hospitalization, and prevent and combat diseases.

Medical support measures and evacuation include:

- 1) Timely search for the wounded/sick on the battlefield and providing them with first aid as quickly as possible.
- 2) Removal of casualties from the battlefield and transport to MTF.
- 3) Reception, triage, medical/specialized treatment, provision of necessary assistance to the wounded/sick, preparation for further evacuation or definitive treatment, medical rehabilitation, and medical-military expertise.

According to the provisions of NATO Directive "ACO Directive (AD)83-1" from 2010, the imperative of the optimal time interval in providing medical assistance, known as the "Golden Hour," has been replaced with the "10-1-2" interval, which consists of:

- Control of airways and temporary hemostasis - within 10 minutes from the time of injury.
- Evacuation to a medical unit capable of resuscitation/lifesaving - within 1 hour from the time of injury.
- Evacuation to a medical unit providing emergency surgical care - within 2 hours from the time of injury.

During the testing of the time duration in the "Falcon Medic-2016" simulation exercise, it was found that the "10-1-2" interval does not provide the optimal time for medical assistance by the company medic who operates at the Casualty collection point (CCP), specifically in terms of administering analgesics and establishing peripheral venous access.

Based on the results of the exercise mentioned above, it is proposed to introduce the "10-30-1-2" interval into the process of planning medical support staging in operations:

- Control of airways and temporary hemostasis - within 10 minutes from the time of injury.
- Administration of analgesics and establishment of peripheral venous access - within 30 minutes from the time of injury.
- Evacuation to a medical unit capable of resuscitation/lifesaving - within 1 hour from the time of injury.
- Evacuation to a medical unit providing emergency surgical care - within 2 hours from the time of injury.

The provision of medical assistance to the wounded/sick during combat operations is carried out at medical points/medical units, which are deployed along the evacuation routes in a specific sequence. These medical points/units are referred to as "medical evacuation stages."

Medical evacuation stage comprises all medical forces and assets deployed along the evacuation routes with the task of receiving and triaging the wounded/sick, providing necessary medical assistance, and preparing them for evacuation to the next stage.

Based on the "optimal interval" and the analysis of the capabilities of medical institutions within the national healthcare system, the results of the "War Game" and Map Exercises, as well as the analysis of the medical support staging in operations in the Armed Forces of NATO member countries and the United States, it is proposed to categorize medical support into four levels, Role 1, Role 2, Role 3, and Role 4.

Medical treatment facilities are categorized into Roles, defined by minimum clinical and paraclinical capabilities available. The concept of capability should be understood as "what the medical point/unit can do" according to its responsibilities, competencies, and equipment. The capabilities of a specific Role are included in those of the immediate superior Role. MTF of a specific Role cannot be reduced below the minimum responsibilities established.

MTF has the same level of readiness and mobility as the military structure it supports.

Role 1-level medical unit includes the following capabilities:

- 1) Provides primary medical assistance to the personnel, including first aid activities (medical aid), triage, resuscitation, and stabilization.
- 2) Handles the gathering of casualties and prepares them for evacuation.
- 3) Provides elements of preventive medicine.
- 4) Provides medical protection against weapons of mass destruction likely to be used by the enemy.
- 5) May include minimal capabilities for temporary patient care, primary dental care, a laboratory for basic analysis, specialized personnel for combat stress management.
- 6) Can allocate forces and assets for the medical support of forces in forward or isolated positions.
- 7) Can allocate forces and assets to establish rapid intervention medical teams.

Is typically in support of the battalion/brigade.

Role 2-level medical unit includes the following capabilities:

- 1) Is a medical structure capable of both receiving and triaging patients and providing resuscitation and shock treatment at a higher level.
- 2) Manages routine care for the wounded/sick, including those caused by weapons of mass destruction, for immediate recovery or evacuation to other medical units.
- 3) Provides surgical stabilization of patients for life or limb saving (minimum 1-2 primary surgical assistance teams).
- 4) Includes inpatient facilities for internal medicine and isolation for communicable diseases.
- 5) Capabilities for primary dental care.
- 6) X-Ray.
- 7) Clinical laboratory and pharmacy.
- 8) Team for combat stress management.
- 9) Manages and executes medical evacuations from Role 1.
- 10) Provides elements of preventive medicine.

Is in support of the tactical group.

For this purpose, a Role 2-level medical unit will include public healthcare institutions, district hospitals in the operational area or nearby.

Role 3-level medical unit includes the following capabilities:

1) Is the medical unit intended to provide secondary medical assistance, with the capacity to receive and retain patients in a hospital who are severely injured or seriously ill for complete diagnosis, administration, and/or completion of qualified/specialized surgical treatment and recovery for combat.

3) Blood transfusion and blood substitutes.

4) May include sections staffed with personnel specializing in neurosurgery, maxillofacial surgery, advanced medical imaging: computerized tomography, ultrasound, arthroscopy, etc.

Role 3 includes the Central Military Hospital, public healthcare institutions, municipal clinical hospitals.

Role 4-level medical unit is the medical unit that provides medical assistance through the entire spectrum of medical specialties, investigations, and medical procedures and includes public healthcare institutions at the national level.

4. Medical Support at the Tactical Level

4.1 Leadership of Tactical-Level Medical Support. Tactical-level medical support encompasses specific medical service activities carried out in the operational area with the goal of preserving the health of the personnel and maintaining the combat capability of the units participating in combat actions. The tactical level in the hierarchy of medical support leadership is represented by the battalion's medical service chief and the tactical group's medical service chief.

The medical service chief and the medical units within the military unit/tactical group form their respective medical services: the battalion medical service and the medical service of the task force.

The leadership of the medical service during combat actions must primarily focus on ensuring the continuity and timeliness of all medical support measures for the forces/troops. The main activity of the medical service chief during this period is the execution of maneuvers with the medical service's forces and assets in response to the evolving situation. To establish the medical service of the tactical group, the forces and assets of the medical service of the units/subunits forming the given task force or reinforcing it are designated.

Within the framework of these maneuvers with the medical service's reserve forces and assets, measures should be taken to allow their most effective use in fulfilling medical service tasks in changing situations. To ensure proper maneuvering, a reserve of medical service forces and assets that are not currently in use and are intended to address medical support issues related to changing situations should be created.

The following types of maneuvers with the medical service's reserve are identified:

1) Coherent movement of existing medical subunits/formations and other forces and assets.

2) Movement, deployment, and initiation of reserve activities.

3) Strengthening deployed medical formations with additional forces and assets.

4) Redeployment of casualty collection and evacuation means, medical formations, medical materiel, etc., during combat actions.

5) Expanding or reducing the volume of medical care in medical subunits/formations.

6) Shifting the flow of casualties from one medical formation to another.

Based on the conclusions, the medical service chief decides on the organization of medical support in a specific situation (or revises decisions made earlier). Depending on the importance, content, and volume of planned activities, as well as the created conditions, the medical service chief reports to the commander (superior) or independently takes measures with subsequent reporting regarding the actions taken.

To guide and verify the measures established in the medical support plan, the medical service chief is obliged to conduct inspections of the medical units and formations subordinate to them.

To ensure continuity and effectiveness of leadership, consideration should be given to the possibility of maintaining permanent communication with subordinates and superiors to receive timely information about changing situations, command decisions (orders), and provide appropriate instructions for the medical service. Communication within medical subunits/formations is organized by their respective commanders (chiefs) using available equipment.

4.2 Allocation of Forces and Means of the Medical Service at the Tactical Level.

Following the analysis of the results of the "Falcon Medic-2016" bilateral simulation exercise, the "War Game" results, and the Staff Exercises, it is proposed to distribute the forces and means of the medical service at the tactical level into four stages:

- 1) Point of injury.
- 2) Casualty collection point.
- 3) Battalion aid station.
- 4) Tactical group/brigade medical treatment facilities.

It is necessary to initiate the provision of medical assistance based on the imperative "10-30-1-2."

The analysis of medical losses in the North Caucasus military conflict found that 20% of all deceased individuals could have survived if they received timely assistance on the battlefield. Between 20% and 40% of all casualties who died on the battlefield did so due to traumatic shock and hemorrhage. Up to 13% of casualties arriving at the regiment's medical point were in serious condition due to massive hemorrhaging without the application of a hemostatic tourniquet, and 50% had fractures without immobilization.

To reduce the mortality rate, it is necessary to initiate the provision of first aid as quickly as possible from the moment of injury. The optimal time for providing first aid is within the first 10 minutes at the site of injury, even "under fire."

First aid measures include:

- 1) Basic life support.
- 2) Temporary hemostasis by applying a compression bandage or tourniquet.
- 3) Applying a dressing to the wound.
- 4) Provisional immobilization of fractures.

Analyzing the provision of first aid during the North Caucasus military conflict, it was found that, in general, self-help and mutual aid accounted for 28.6% in the first conflict and increased to 73.4% in the second military conflict.

Based on the lessons learned from the conflicts mentioned above, the position of a medic was introduced at the platoon level. Military personnel without specialized medical education were appointed to the roles of medic instructors within the units. Specialized training was conducted at dedicated training centers, with a course duration of 6 months.

Special attention was given to the training of personnel within the task force in medical training, particularly in providing first aid.

Based on the results of the "Falcon Medic-2016" bilateral simulation exercise, it is proposed to introduce the role of a medic for the provision of adequate first aid in the task force's organizational structure.

Medics cannot be expected to remove casualties from the battlefield. To evacuate casualties, the company commander provides soldiers who temporarily perform the duties of stretcher bearers.

To fulfill this task, it is necessary to ensure adequate training in medical-sanitary preparation for all soldiers in providing first aid and evacuating casualties from the battlefield.

To provide first aid within the first 10 minutes, it is necessary to modify the standards for equipping the Armed Forces with medical-sanitary means currently in use.

Within the framework of the "Falcon Medic-2016" bilateral simulation exercise, a comparison was made between the results of applying medical-sanitary means in the inventory of the National Army and the National Guard of the State of North Carolina.

According to the existing standards, the National Army personnel were equipped with a Soviet-style individual dressing package (with a rubber cover) and a rubber hemostatic tourniquet, while medics were provided with a "Medic Bag."

The National Guard personnel were equipped with an "Individual Medical Kit" and a "Medic Bag," which included an Israeli-type tactical bandage and a tourniquet.

One advantage of applying the tactical bandage is the more pronounced compressive effect compared to the Soviet-style individual dressing package. The Israeli-type tactical bandage, unlike the Soviet-style dressing package, does not allow for wound dressing in the case of pneumothorax. For this purpose, the American-type individual kit is supplemented with a chest bandage with a valve and a needle for thoracic decompression. This puncture is performed at a subsequent stage of evacuation by medical personnel.

The advantage of applying the tourniquet from the individual kit is its greater resistance to tearing during application, as well as the possibility of self-application with minimal physical effort compared to a rubber hemostatic tourniquet. The construction of the tourniquet allows for self-application.

Based on the results obtained in the aforementioned exercise, it is proposed to modify the standards for equipping the Armed Forces with medical-sanitary means by providing the personnel with an individual medical kit containing the following items (Table 5):

Table 5. Minimum contents of the Individual Medical Kit

Nr. d/o	Equipment	Unit of measure	Quantity
1.	Turnichet	Ps.	1
2.	Tactical bandage	Ps.	1
3.	Tape	Ps.	1
4.	Steril dressing package	Ps.	1
5.	Triungulat bandage	Ps.	1
6.	Eya patch	Ps.	1
7.	Isothermal	Ps.	1
8.	Nasopharyngial tube	Ps.	1
9.	Thoracic bandage with valve	Ps.	2

Nr. d/o	Equipment	Unit of measure	Quantity
10.	Decompression nidle	Ps.	1
11.	Non-steril gloves	pairs	1
12.	Scissors	pairs	1
13.	Case	Ps.	1

Table 6. The minimum contents of the combat lifesarver kit

Nr. d/o	Equipment	Unit of measure	Quantity
1.	Turnichet	Ps.	5
2.	Tactical bandage	Ps.	20
3.	Tape	Ps.	2
4.	Steril dressing package	Ps.	20
5.	Triungulat bandage	Ps.	2
6.	Eya patch	Ps.	5
7.	Isothermal	Ps.	2
8.	Nasopharyngial tube	Ps.	5
9.	Thoracic bandage with valve	Ps.	10
10.	Decompression nidle	Ps.	10
11.	Non-steril gloves	pairs	5
12.	Scissors	pairs	1
13.	Pencil	Ps.	1
14.	Report card	Ps.	1
15.	Medical triage card	Ps.	5
16.	Case	Ps.	1

The given medical kits do not contain medicinal preparations.

The next element in the tactical-level allocation system is the Casualty Collection Point (CCP), which serves as a shelter against infantry fire and, to the extent possible, adverse weather conditions (a trench, a projectile pit, a shelter, etc.). Casualties from the company are grouped here, and pre-medical aid is provided at this stage.

Basic measures include:

- 1) Pain relief.
- 2) Establishing venous access and administering intravenous solutions, including blood substitutes.
- 3) Checking the application of tourniquets and correcting the immobilization of fractures.

Currently, infantry company organizational structures include the position of the company's field medic. This position is staffed with personnel with specialized medical training. During the bilateral simulation exercise "Falcon Medic-2016" and international exercises "Scutul Păcii" conducted on national territory in the years 2016-2019, it was noted that the activities of the company's field medic at the Casualty Collection Point, particularly the transportation/transshipment of casualties and communication via radio station, are challenging.

To strengthen medical assistance at this stage, it is proposed that a special team be formed during the preparation for combat actions, consisting of the company's field medic, a radio operator, and 2 stretcher bearers.

The company's current structure does not include these functions at this stage, and it is proposed to form this team from the forces and assets provided as reinforcements to the battalion.

The Casualty Collection Point is a fundamental element in the medical triage system, representing a complex process of identifying and categorizing casualties into homogeneous groups based on the severity and nature of injuries, the urgency of medical care, the sequence, mode, and destination of evacuation, the danger to the health of individuals nearby, the capacity and available medical-military resources, as well as specific circumstances imposed by the impact [16].

The main purpose of medical triage is to ensure the timely provision of the maximum possible volume of medical assistance while covering the maximum number of casualties. At the Casualty Collection Point, triage begins with the allocation of casualties into triage groups based on vital signs, using the minimum volume rapid triage algorithm (TRAMIN), based on four criteria: the ability to move independently, level of consciousness, breathing, and circulation (Figure 3).

Medical triage is carried out sequentially by rapidly examining each casualty, assessing their condition, and assigning them to the appropriate triage groups.

Depending on the severity and nature of injuries, the urgency of medical care, and evacuation, five triage groups are established, and casualties are assigned to them. Each triage group is assigned a color code, namely: Red, Yellow, Green, Gray and Black (Annex 1) [16].

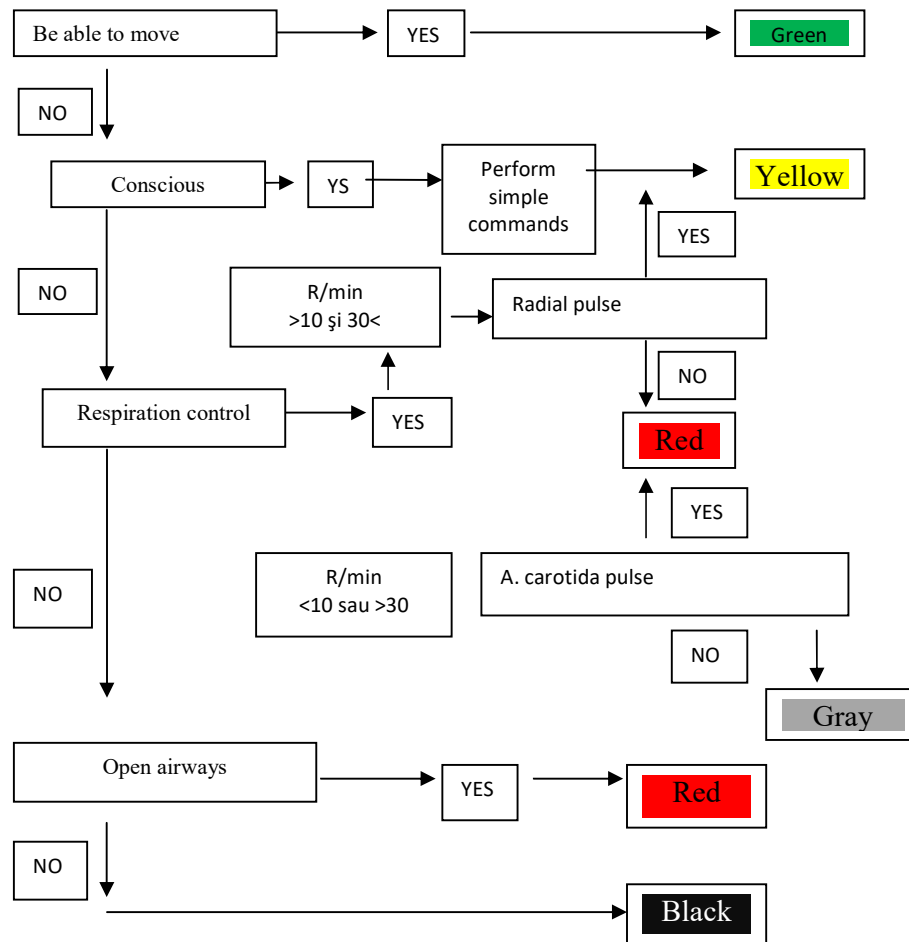


Figure 3. TRAMIN Algorithm

At the Wounded Collection Point, the Triage Medical Record/Injured Person Card is completed, recording the data and measures taken. During the exercises mentioned above, simulating the activities of the company's medic at the Wounded Collection Point, it was found necessary to adjust the contents of the medical kits for personnel. Analyzing the equipment of medical personnel operating at the Wounded Collection Point within the U.S. Armed Forces and ensuring the possibility of providing pre-medical assistance within the first 30 minutes after injury, it was proposed to equip the kit based on the "Medical Care Kit for Medical Personnel" (Annex 2). The newly proposed kit, called the "Medical Personnel Kit," includes:

Analgesic - Promedol or Tramadol solution, anti-shock preparations.

Catheters - for venous access, in case venous access cannot be ensured, a device for intraosseous access is provided for perfusion.

The kit is equipped with infusion solutions - 9% NaCl and Ringer-Lactate.

Dressing materials include: Tactical compressive dressing package of the Israeli type, burn bandage, abdominal bandage, eye bandage.

From instruments: tongue holder, mouth dilator, scissors.

Means for immobilizing limbs and two types of lanterns: one for examination and one for forehead fixation (Annex 3).

The next point in the tactical medical support system is the Role 1 MTF, Battalion aid station (BAS). BAS is the basic subunit of the battalion's medical service. In order to ensure the provision of medical assistance within the first hour after injury, PMB has the following basic functions:

1. Receiving, medical triage, and registration of injured/sick arriving at the medical point;
2. Decontamination of the injured/sick;
3. Stabilization of vital functions/provision of first aid;
4. Preparing the injured/sick for subsequent evacuation;
5. Providing outpatient treatment assistance to mildly injured/sick individuals;
6. Implementation of sanitary and epidemiological measures within the battalion;
7. Providing medical and sanitary means to battalion subunits;
8. Conducting medical-military training for battalion personnel.

Based on the analysis of the organization of medical support in contemporary military conflicts, the following picture was observed. At the beginning of the first military conflict in the North Caucasus (1996-1999), the organizational structure of a battalion within the Russian Armed Forces had only one medic, and it was noted that there was an insufficient number of medical personnel involved. Subsequently, the decision was made to apply the principle of bringing medical assistance closer to the battlefield by strengthening the medical subunits at the tactical level with additional personnel and resources. The battalion's medical point was composed of a medical team with the following composition: one doctor, one medic, and 4 medical instructors [7]. For the evacuation of the injured, 3 armored vehicles and one ambulance were designated.

In the structure of the U.S. Armed Forces involved in contemporary military conflicts, the battalion's medical point, as part of the battalion's medical platoon, consists of two sections: the treatment section and the ambulance section. The treatment section is a basic element of the

medical point and represents a medical team composed of one doctor and 3 medical assistants. The ambulance section includes 2 ambulance teams: one on tracks and one on wheels [13].

Currently, the organizational structure of the infantry battalion's medical point within the National Army is not standardized. In the medical points of independent battalions, a medical team consisting of one doctor, 1-2 medics, and a medical vehicle driver is active. The structure of the BAS of infantry battalions within infantry brigades is represented only by one medic and one medical vehicle driver.

During the simulation of PMB activities in multinational exercises "Shield of Peace" conducted in the years 2016-2019, it was found necessary to establish a medical team for activities within the infantry battalion's medical point, with the following composition: one doctor, 2 medics, and one medical vehicle driver. The ambulance driver is assigned the role of a radio operator. Special vehicles are provided for transporting BAS personnel and material goods.

Contemporary military conflicts are characterized in large part by conducting combat actions with forces and means in accordance with peacetime organizational structures (or partial mobilization). Based on this characteristic, the organizational structure of medical service subunits in peacetime must be similar to that in wartime. Depending on the situation, BAS activities can be conducted in a sheltered location with minimal setup, tents, or specially arranged premises. The basic layout for the deployment of the battalion's medical point in a shelter is presented in Annex 5.

In campaign conditions, the medical point is set up 2-2.5 km from the line of fire. To ensure more efficient setup and organization of the medical point's activities, a shelter with an approximate area of 30 m² is required. This shelter can accommodate up to 6-8 stretcher patients, 6-8 seated patients, as well as spaces for medical staff to provide necessary medical assistance. Special transport spaces are arranged for evacuation. These spaces also house means of evacuation for the subsequent transportation of the injured/sick.

The medical point's equipment includes medical and sanitary materials for providing pre-medical and initial medical assistance. For the doctor's activity in campaign conditions, a medical kit is provided. In addition to anti-shock preparations and dressing materials, the kit contains the following sets:

1. Cricothyrotomy set;
2. Intubation set;
3. Suturing set;
4. Temporary hemostasis set;
5. Immobilization set.

Additionally, the medical team is equipped with oxygen cylinders transported in special carriers. In case of activity in tents or arranged premises, the minimum equipment includes the following medical and sanitary means:

1. Resuscitation set;
2. Vital signs monitor;
3. Defibrillator;
4. Electric and manual suction devices;
5. Oxygen cylinders;
6. Oxygen concentrator with a minimum capacity of 8 liters per hour.

After providing the necessary medical assistance, the injured/sick will be evacuated to the next stage depending on their triage group. In case of a large number of injured or the possibility

of the adversary infiltrating the medical point's area, triage and pre-medical/medical assistance will be provided immediately in the transport vehicles in order to transport all injured/sick individuals using the same means of transport for subsequent evacuation.

The next element in the system of medical support escalation is the brigade's medical point. This unit serves as a basic subunit of the brigade/task force's medical service. Its primary task is to evacuate the wounded/sick from the brigade's subunits, stabilize vital functions/provide initial medical aid, and prepare the wounded/sick for subsequent evacuation within the first two hours after injury.

Based on the analysis of the organization of pre-hospital medical support in contemporary military conflicts, it was found that during the military conflicts in the North Caucasus, the organizational structure of the regiment's medical point was modified. Since 1997, the organizational structure of infantry regiments has included a medical company consisting of 2 surgeons, an anesthesiologist, a therapist, a psycho-neurologist, and a medical support planning officer.

For the evacuation of the wounded from the regiment's medical point, helicopters were more frequently used. Qualified medical assistance was provided at the independent medical battalion.

Based on the accumulated experience, the way medical assistance is provided in the independent medical battalion has been modified. Due to the detachment of medical personnel from the battalion, for reinforcing the medical units at the lower echelons, the mission of the battalion has been shifted towards providing initial medical aid at a higher level, with the goal of stabilizing vital functions and preparing for evacuation to a higher echelon.

Basic surgical interventions performed at this stage included primary surgical wound care. Throughout the entire period of the second military conflict (1999-2002), only two laparotomies were performed within all three deployed battalions, and both had a lethal impact.

Since 1996, the concept of "*Early Specialized Surgical Care*" by E. Gumanenco, based on the medical air evacuation of the wounded from medical units directly to mixed military hospitals, has been implemented in medical support. This approach was implemented in the first conflict in 30% of cases and in the second conflict in 55% of cases.

Analyzing the concept of medical support for United States Armed Forces at the brigade level (Role 2) in contemporary conflicts, the following capabilities were identified for Role 2 units:

1. Primary medical care
2. Surgical management for stabilizing the patient's life or limbs
3. Combat stress management
4. Medical imaging elements (radiography, optometry)
5. Primary dental care
6. Hospitalization for 20 to 40 patients for up to 72 hours
7. Preventive medicine measures
8. Minimal capabilities for reinforcing medical units at the maneuver battalion level
9. Medical logistics (Class VIII)
10. 100% mobility

Each branch of the armed forces has its own Role 1 medical units. In the Army, these units are represented by the medical company and the forward surgical team.

Based on lessons learned after the Desert Storm operation (1991), it was decided to exclude the Mobile Army Surgical Hospital (MASH) from the system of treatment and evacuation at the division level. The missions of the hospital were assigned to the Forward Surgical Team (FST), which is responsible for providing surgical assistance to wounded individuals who, for various reasons (hemorrhage, asphyxiation), cannot be transported to the next echelon. The team consists of 20 personnel, including 3 general surgeons, one traumatologist, 2 nurse anesthetists, and 3 general nurse assistants. The FST operates in three tents and can set up within 1.5 hours. It can perform up to 20 surgical interventions per day, with subsequent intensive therapy for up to 6 hours for a maximum of 8 wounded patients, for up to 72 hours. The team is fully mobile and can be transported by 6 vehicles or by C-130 aircraft. It is autonomous in terms of medical supplies but requires additional provisions for food, drinking water, electricity, maintenance, and security. It does not have the capability to perform radiological and laboratory examinations.

Surgical care for the wounded is provided using the "Damage Control" principle, which involves surgical interventions to save the lives of the wounded. "Damage Control" is a term used in the U.S. Navy's lexicon and involves using all available means to ensure the survival of a sinking ship.

During participation in medical support operations, the Forward Surgical Team is designated for reinforcing the medical company within the brigade, and for the rest of the time, its personnel work in a mixed military hospital.

Based on the results obtained in the aforementioned exercises and contemporary practices in the organization of medical support for tactical groups/brigades, the deployment of the tactical group/brigade medical point in a campaign is proposed as follows: triage section (triage field and tent, decontamination field), emergency and dressing section, evacuation section, evacuation coordination cell, isolation unit, pharmacy, helicopter landing and takeoff area, personnel tents, morgue area, generator area (Annex No. 7).

Depending on the medical-tactical situation, the medical point of the task force needs to be managed with existing forces and means (the Medical Detachment of the Central Military Clinical Hospital as a mobile surgical team). Placing the medical point at the borders of the operational area allows for the use of the unit as a platform for casualty evacuation and involves the forces and resources of the national healthcare system in the functional sections' activities.

The presented scheme cannot be a template; in some conditions, the emergency and dressing section may be set up and arranged in a tent, and the decontamination field may be arranged in another location depending on the wind direction to avoid contaminating the medical point's area. Additionally, terrain fortification is carried out to protect the personnel and casualties and to defend the medical point.

Placing the medical point at the borders of the operational area allows for the involvement of forces and resources from the healthcare system in the activities of the functional sections.

The functional sections of the medical point are deployed in such a way as to ensure the free movement of evacuation means, as well as the rapid loading and unloading of casualties. For this, the sizes of the tents and the distance between them need to be considered.

The triage section is designed for receiving, registering, medical screening, and decontamination, including the guidance post, decontamination field, and triage tent. The guidance post is set up at the entrance to the medical point's territory. It has a shelter with a "STOP" bar, and a "Red

Cross" flag is displayed. An instructor in sanitation, who performs primary triage, operates at this post. Incoming casualties are divided into groups:

1. Casualties who pose a threat to the health of others: a) Contagious or suspected patients - they are directed to the isolation unit. b) Those requiring decontamination - they are directed to the decontamination field.
2. Casualties who do not pose a danger to others - they are directed to the triage field/tent using the same means of transport they arrived in, with the selection of individuals who can move independently.

At the triage field/tent, during the debarkation of casualties from transport means, the doctor evaluates their severity and categorizes them into 4 groups:

1. Casualties who require emergency medical assistance as a priority (Red code).
2. Casualties who receive medical assistance in the second rank.
3. Casualties who will be evacuated to the next stage without receiving medical assistance at this stage.
4. Moribund casualties with minimal chances of survival receive symptomatic therapy (Gray code).

Casualties are not removed from the stretcher. After receiving medical assistance, they will be evacuated to the subsequent medical stages on the same stretcher.

The means of transport that brought casualties to the brigade's medical point will be equipped with stretchers from the stretcher reserve stored at the triage field.

The emergency and dressing section is intended for providing first aid (resuscitation, stabilization of vital functions, etc.). The medical personnel are divided into two teams:

1) The first team performs emergency medical assistance (resuscitation, stabilization of vital functions), consisting of a doctor and a corpsman/medical assistant. This team is made up of medical personnel from the Medical Detachment of the Central Military Clinical Hospital.

2) The second team handles dressing procedures, including a doctor and a corpsman/medical assistant. This team consists of medical personnel from the brigade and the military unit forming the task force.

In this section, medical records are completed: primary medical record/triage medical record, casualty register, and procedure and dressing register.

The evacuation section is intended to receive casualties from the functional sections of the medical point, conduct vital signs control, and prepare for subsequent evacuation, along with completing all medical documentation.

The isolation unit is intended for temporary isolation of contagious or suspected casualties. It is set up at an optimal distance from other functional sections of the medical point.

The medic or medical assistant prescribes medical treatments and monitors the condition of casualties in isolation. Casualties from the isolation unit are evacuated to subsequent medical stages using separate transport, which is later decontaminated.

The infirmary chief manages the activities of the evacuation section and the isolation unit and monitors the condition of casualties in the respective subdivisions.

Based on the results of the exercises ("Falcon Medic-2016" and "Scutul Păcii"), the important role of creating the evacuation coordination cell has been noted. The evacuation coordination cell is subordinate to the medical point's leadership and coordinates the evacuation of casualties to the next medical stages.

The cell is equipped with workstations, chairs, an information board, communication means, and air conditioning/heating equipment. The following information is available in the cell:

1. The location and capabilities of medical units within the tactical group and at a higher level.
2. Routes (itineraries) for material supply and casualty evacuation.
3. Communication procedures.
4. An alphabetical list of casualties who have arrived at the medical point.

Depending on the situation and the availability of communication means, evacuation coordination can be conducted directly through the "112" service or through the medical support cell of the National Army Command Post.

The pharmacy is intended for receiving, storing, and distributing medical and sanitary materials. The chief pharmacist is responsible for the activities of this subdivision and for preparing and presenting reports to the medical point's leadership regarding medication and medical material needs.

4.3. Medical evacuation. Medical evacuation represents the assisted and specialized transport of casualties/patients to the medical evacuation stages (Role 1) to higher medical units equipped with diagnostic or therapeutic capabilities, using ground or aerial technical means.

Tactical medical evacuation is carried out within the operational area using:

1. Ground means such as armored and/or unarmored medical vehicles on wheels or tracks.
2. Aerial means, with fixed-wing aircraft.

All medical evacuation means must be equipped with communication tools to achieve:

1. Proper guidance to the incident location or to the nearest or most suitable medical unit based on the situation.
2. Reduction of intervention time.
3. Properly sized response, proportional to the scale of medical losses, to maximize efficiency.
4. Direct communication with the incident location.
5. Direct communication between the medical personnel involved in the intervention and the qualified/specialized medical personnel at the receiving medical unit.

Continuous monitoring of the location and destination of each casualty has implications for the operational readiness of their originating units, to determine the need for reinforcement. Ground medical evacuation is carried out using specialized or, when necessary, improvised means, from the site of injury/illness to one of the Role 1, 2, or 3 units, between medical evacuation stages at different levels, or to the air evacuation embarkation point.

The most commonly used means for ground medical evacuation is the medical vehicle, which must have the same level of mobility and protection as the military structure it supports. Constructively, it can be wheeled or tracked, armored or unarmored.

The current situation regarding the provision of medical transport involves maneuvering to reinforce the forces/troops involved in the operation. The minimum specialized equipment is presented in Annex 3.

For the evacuation of casualties/patients outside the operational area, medical vehicles from the national healthcare system (NCEM, SMURD) are designated.

To successfully execute aerial medical evacuation missions, the existence and functioning of the command, control, and communication system are fundamental. The documents used are presented in Annex 4.

GENERAL CONCLUSIONS

1) Despite the fact that most military operations currently conducted worldwide are peacekeeping in nature, active conflict situations can also arise, including local or regional military conflicts.

2) Recent experience in medical support for forces in military conflicts indicates that the concept of medical support in a local military conflict differs from the principles of organizing medical support in a major military conflict

3) The physical-geographical, medical-geographical, and geopolitical factors in the theater of operations (South-Est) favor the organization and implementation of medical support in the operation.

4) Based on the specific characteristics of the local military conflict, medical support planning, as well as the complex of sanitary-hygienic and anti-epidemic treatment and evacuation measures, medical logistics, need to be adapted to the actual tactical and medical situation.

5) The structure and equipment of medical units involved in tactical-level medical support require adjustment to contemporary requirements.

6) The research results have contributed to addressing an important scientific issue by scientifically and methodologically substantiating medical support in military operations within the National Army at the tactical level.

PRACTICAL RECOMANDATIONS

1) The General Staff of the National Army should develop a long-term concept for the development of medical service capabilities as part of the National Army's capabilities development plan.

2) The General Staff of the National Army should modify the organizational structure of the medical service within major units and military units of the National Army by forming teams with a physician for activities within the infantry battalion's aid station.

3) The General Staff of the National Army should ensure the review of the provision of medical personnel and medical units with medical and sanitary materials, as well as the norms for the allocation of medical and sanitary materials in the Armed Forces.

4) The General Staff of the National Army should ensure the inclusion of training for medical personnel in the use of contemporary medical support principles, forms, and methods in the training and further education system.

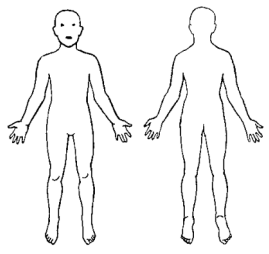

5) The General Staff of the National Army should ensure the improvement of cooperation and interaction between the medical service of the Armed Forces and the national healthcare system.

BIBLIOGRAPHY

1. Щербакова Е. *Людские потери в вооруженных конфликтах 1946-2015 годов*. Демоскоп Weekly.2016; 689-690. Disponibil la: <http://www.demoscope.ru/weekly/2016/0689/barom01.php>. [accesat la 11.09.2017].
2. Global Trends in Armed Conflict Events, 1946-2016. Disponibil la: <http://www.systemicpeace.org/conflicttrends.html#fig2/> [accesat la 11.09.2017].

3. William L., Keith N., John S., Joseph S., Gary W. The Changing Face of War: Into the Fourth Generation. *Marine Corps Gazette*, October 1989, pp. 22–26.
4. Sarcinchi A., Siteanu E. *Conflictele atipice ale secolului al XXI-lea*. Editura Universității Naționale de Apărare „Carol I”. București, 2015
5. *Materiale Conferinței medicale anuale NATO*. Octombrie, 2011. Germania
6. Гуманенко Е., Самохвалов И., Трусов А. Хирургическая помощь раненым в контртеррористических операциях на Северном Кавказе: становление военно-полевой хирургии локальных войн и вооружённых конфликтов (Сообщение седьмое, заключительное). *Воен.-мед. журн.* 2006. № 9. С. 19-28.
7. Гуманенко Е., Самохвалов И., Трусов А., Бояринцев В. Хирургическая помощь раненым в контртеррористических операциях на Северном Кавказе: специализированная хирургическая помощь в лечебно- профилактических учреждениях 2—3-го эшелонов (Сообщение шестое). *Воен.-мед. журн.* 2006. № 9. С. 9-18.
8. Котенко П., Пак Р., Головинова В. Движение легкораненых и больных в военных госпиталях в ходе операции по принуждению Республики Грузия к миру (август 2008 г.). *Воен.-мед. журн.* 2014, № 9. С. 14-19.
9. Корнюшко И., Бояринцев В., Амбражук И., Яковлев С. Организация медицинского обеспечения войск в ходе операции о принуждению Грузии к миру. *Воен.-мед. журн.* 2009, № . С. 4-6.
10. *AJP 4.10 Allied Joint Doctrine for Medical Support*. Brussels,2019.
11. ACO Directive (AD) 83-1 (Edition 2) *Medical Support to Operations*. Brussels.2010
12. Richard T., Peacock T., Cubano M., Elster E., Gurney J., Charlton M., White P., Schmidt C., Gutierrez L. *Emergency War Surgery*. AMSUS,2018
13. *FM 8-10-4. Medical Platoon Leaders handbook, tactics, techniques, and procedures*. Washington, DC, 2001.
14. *FM 4-02.25. Employment of Forward Surgical Teams tactics, techniques, and procedures*. Washington, DC, 2004.
15. *2016 Index of U.S. Military Strength*. Davis Institute For National Security And Foreign Policy. Washington, DC 2016.
16. *Ghid național privind triajul medical în incidente soldate cu victime multiple și dezastre*. Chișinău, 2010.
17. *Medical Support manual for Unated Nationas Field Missins, 3 edition*.UN. New York. 2015

Triage card
(for Peacekeeping operations)

CARTELA RĂNITULUI				CASUALTY		CARD		
Nr.								
Nr. personal militar <i>Personnel Service No.</i>		Numele / Surname:		Prenumele / Other names:		Genul/Gender ♂ ♀		
Unitatea: <i>Unit:</i>			Naționalitatea: <i>Nationality:</i>			Religia: <i>Religion:</i>		
Note (dacă pierderea sanitară este necunoscută) <i>Notes (if casualty is unknown)</i>								
Tipul de rănire sau îmbolnăvire: <i>DTG of Injury or Illness:</i>				Tipul examinării inițiale <i>DTG of Initial Assessment</i>				
Rănit în luptă <i>BI</i>					Respirația <i>Breathing</i>		Spontană / <i>Spontaneous</i> Absentă / <i>Absent</i>	
Rănit nu în luptă <i>NBI</i>			Frecvența respirației <i>Breathing rate</i>				r/min b/min	
Boală <i>D</i>			Căile respiratorii <i>Airways</i>		Obturate / <i>Obstructed</i> Deschise / <i>Open</i>			
Stres <i>Psych</i>	Pupila stângă <i>Left pupil</i>		Pupila dreaptă <i>Right pupil</i>		Ps Ps /min		TA <i>BP</i> mmHg	
	● ● ● ●		● ● ● ●		Contaminarea <i>Contamination</i>		Timp de umplere a capilară <i>Capillary refill time</i>	
Primul ajutor medical și timpul <i>First medical aid and time</i>				Scala Glasgow / <i>Glasgow coma scale</i>				
Analgice <i>Analgesics</i>		Pansament <i>Dressing</i>		Deschiderea ochilor <i>Eye opening</i>		1 2 3 4		
Infuzie <i>Infusion</i>		Imobilizare <i>Imobilisation</i>		Vorbirea <i>Verbal response</i>		1 2 3 4 5		
Intubare <i>Intubation</i>		Garou <i>Tourniquet</i>		Reacția motorie <i>Motor response</i>		1 2 3 4 5 6		
Alte / <i>Other</i>				Total		<i>Puncte / Points</i>		
Diagnostic, simptome <i>Diagnosis, symptoms:</i>								
Evacuare <i>Evacuation</i>			Notă <i>Mentions</i>		Transportarea <i>Transportation</i>			
Decedat <i>Dead</i>			○					
Urgent <i>Urgent</i>			○					
Prioritar <i>Priority</i>			○					
Rutină <i>Routine</i>			○					
Întors în unitate <i>RTD</i>			○					

(revers)

FIȘA DE EVACUARE A RĂNITULUI CASUALTY EVACUATION TAG			
	Punct adunare răniți <i>Company Aid Post</i>	Ambulanța <i>Ambulance team</i>	Punct medical (Roll) <i>Aid Station Roll</i>
Data, timpul / <i>DTG</i>			
Conștient <i>Consciousness</i>			
Agitat / <i>Alert</i>			
Vorbirea / <i>Voice</i>			
Durere / <i>Pain</i>			
Inconștient / <i>Unresponsive</i>			
Puls / <i>Pulse</i>			
TA / <i>BP</i>			
FR / <i>BR</i>			
T° / <i>Temperature</i>			
Diagnostic, simptome <i>Diagnosis, symptoms:</i>			
Ajutor medical + timp <i>Medical care + time</i>			
Analgetice <i>Analgesic</i>			
Perfuzii (injecții) <i>Infusions (injections)</i>			
Antibiotice <i>Antibiotics</i>			
Alte medicamente <i>Other medications</i>			
Proceduri medicale <i>Medical procedures</i>			
Timpul de evacuare <i>Evacuation time</i>			
Decedat <i>Dead</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Urgent <i>Urgent</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prioritar <i>Priority</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rutină <i>Routine</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Întors în unitate <i>RTD</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mod de transportare <i>Transportation</i>			
Nume și semnatura <i>Surname and signature</i>			

MINIMUM EQUIPMENT REQUIRED FOR AMBULANCES

Personal protective equipment (masks, gowns, gloves, etc.) = Note (1)
Basic elements for breathing assistance (pipes, oropharyngeal probes, etc.) = Note (2)
Electric and/or foot vacuum cleaner = 1 pc.
Long spinal board = Note (2)
Cervical collar = Note (2)
Oxygen = Note (2)
Oxygen Masks = Note (2)
AMBU device with balloon = Note (2)
Asherman Type 3 Chest Valve = Note (2)
Intravenous infusion needles = Note (2)
Infusion kits = Grade (2)
Solutions for infusions (glucose 5%, 500 ml bags) = Note (2)
Individual dressing packages = Note (2)
Dressing set for burns = Note (2)
Different size hips = Note (2)
Tourniquets = Grade (2)
Splints (fixed and/or traction) = Note (2)
Stretch = Grade (2)
Blankets = Grade (3)
Kidney trays = Note (3)
Battery powered light source/flashlight = 1 ct.

Notes:

- (1): The quantity depends on the number of crew members.
- (2): The quantity depends on the number of transported wounded/the capacity of the ambulances.
- (3): 1 pc each. for each wounded person carried on a stretcher.

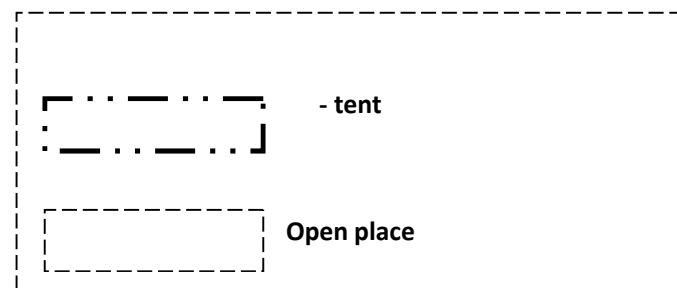
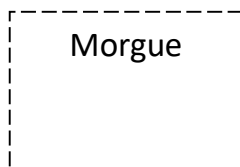
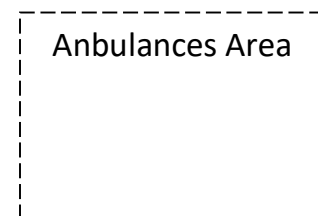
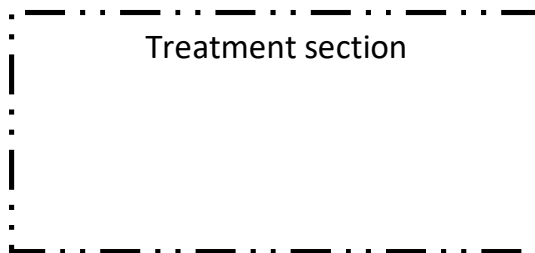
9 LINES REQUEST

Notes: all chapters must be transmitted encoded	
Line	Time (date, time, month, year)
1.	Coordinates of the patient pickup area
2.	Radio frequency, call sign, and suffix
3.	Number of patients by priority: A – Absolute urgency B – Surgical emergency C – Relative urgency D – Minor emergency E – Routine
4.	The need for special equipment: A – It is not B – Hoist, Ropes, Winch C – Extraction equipment D – Fan
5.	Number of patients and method of evacuation: L – Lying down A – Seated E – Escorted (eg for children)
6.	Patient pick-up area security: N – There are no opponent's troops in the area P – Possibly the opponent's troops in the area E – Opponent's troops in the area X – Opponent troops in landing field (military escort required)
7.	Method of marking the patient pick-up area: A – Panels B – Pyrotechnic signal C – Smoke signal D – None E – Other (explain)
8.	Nationality and status of the patient: A – MD own forces (allies) B – MD civilians from own country (allies) C – Military MD non-allies D – MD civilians who are not from their own country (non-allied civilians) E – EPW (Enemy Forces / POW / Detainee) F – Children
9.	CBRN contamination (wartime): C – Chemistry B – Biological R – Radiology N – Nuclear In peacetime - topographic description / obstacles

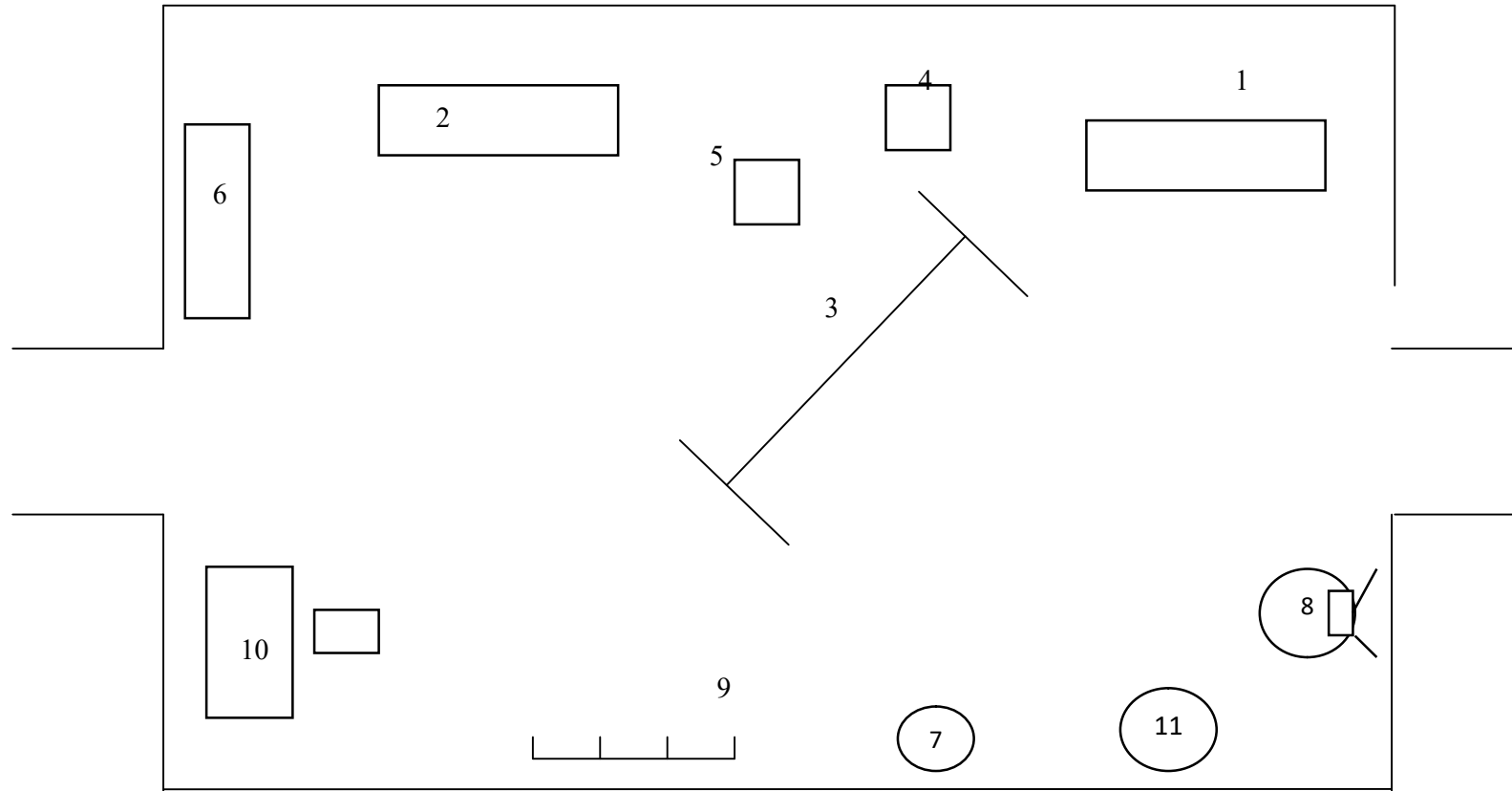
MEDICAL SITUATION REPORT (MEDSITRAP)

Line	FROM	
1		
2	BY	
3	COPY	
4	MESSAGE PRIORITY	
5	MESSAGE IDENTIFICATION //MEDSITREP	
6	REFERENCE	
7	DTG (DATE TIME GROUP)	
8	MEDICAL PERSONNEL	
9	OCCUPATION OF BED	A – Own Forces B – Forces of the Adversary C – Civilians D – Total:
10	VICTIMS FOR SURGERY	A – <i>IMEDIAT</i> B – <i>RUTINE</i>
11	VICTIMS	A – NOT FOR FIGHTING B – DISEASES C – WOUNDED IN ACTION D – COMBAT STRESS
12	VICTIMS EVACUATED	A – RETURN TO SERVICE / // B – EVACUATED TO OTHER MEDICAL FORMATIONS C – EVACUATED FROM AO
13	VICTIMS AWAITING EVACUATION	
14	SURGICAL OPERATIONS	A – OWN STRENGTHS B – THE ADVERSARY'S FORCES C – CIVILIANS D – TOTAL
15	DECEASED	A – OWN STRENGTHS B – THE adversary's forces C – CIVILIANS D – DEATH ON ARRIVAL E – TOTAL
16	MEDICAL LOGISTICS	
17	BLOOD STOCKS	
18	ESTIMATE OF THE MISSION	– CAN BE CONDUCTED – MAY BE CONDUCTED WITH RESTRICTIONS – IT CANNOT BE CONDUCTED

The basic scheme of the Battalion aid station



Arrangement of the tent of Emergency Care and Dressing

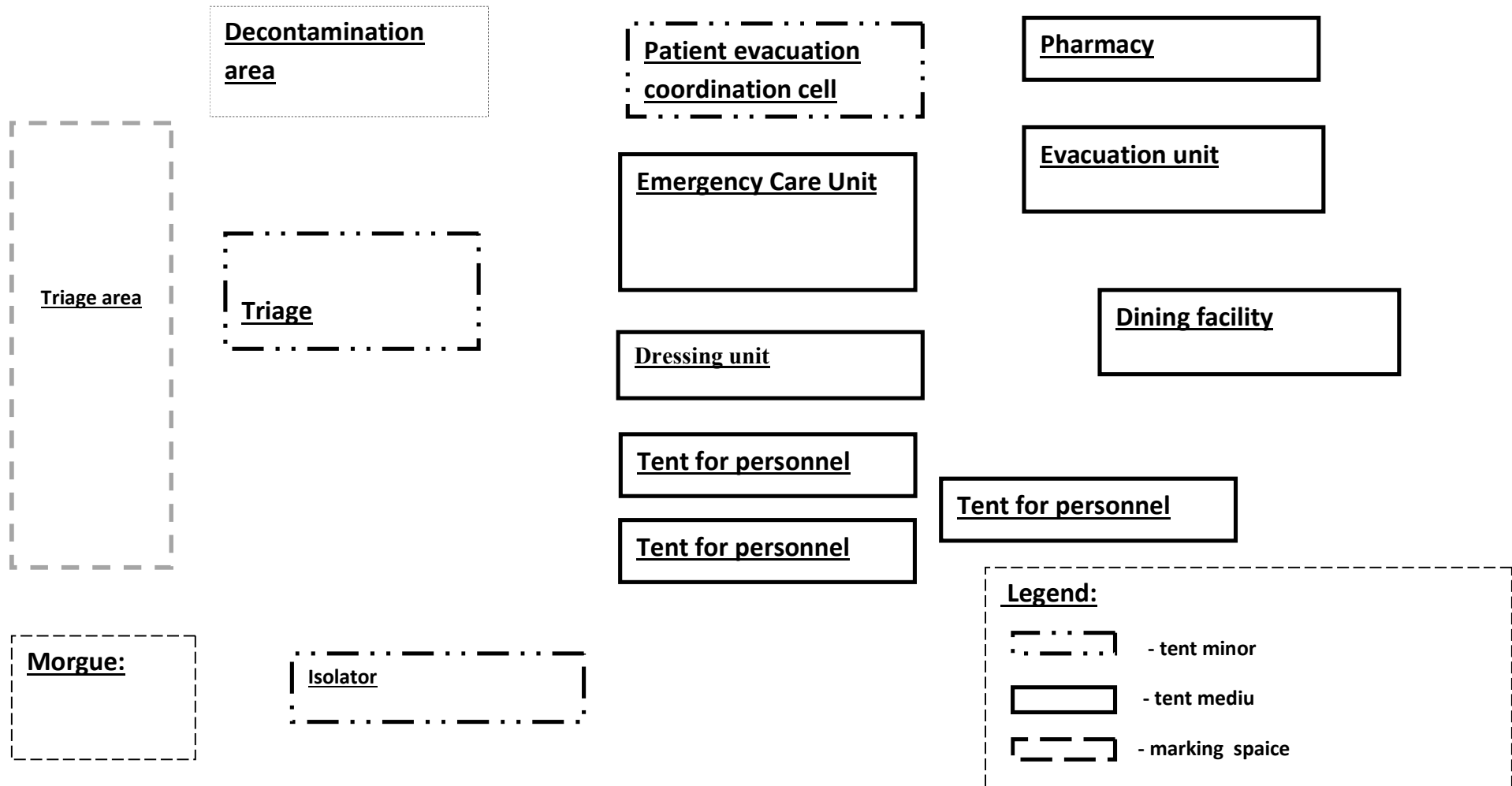


1 – table; 2 – support for consumables ; 3 – stretchers support; 4 – monitor; 5 – oxygen concentrator; 6 – chair for injured; 7 – drinking water ;
8 – basin; 9 – hanger; 10 – table with chair; 11 – climat control divice;

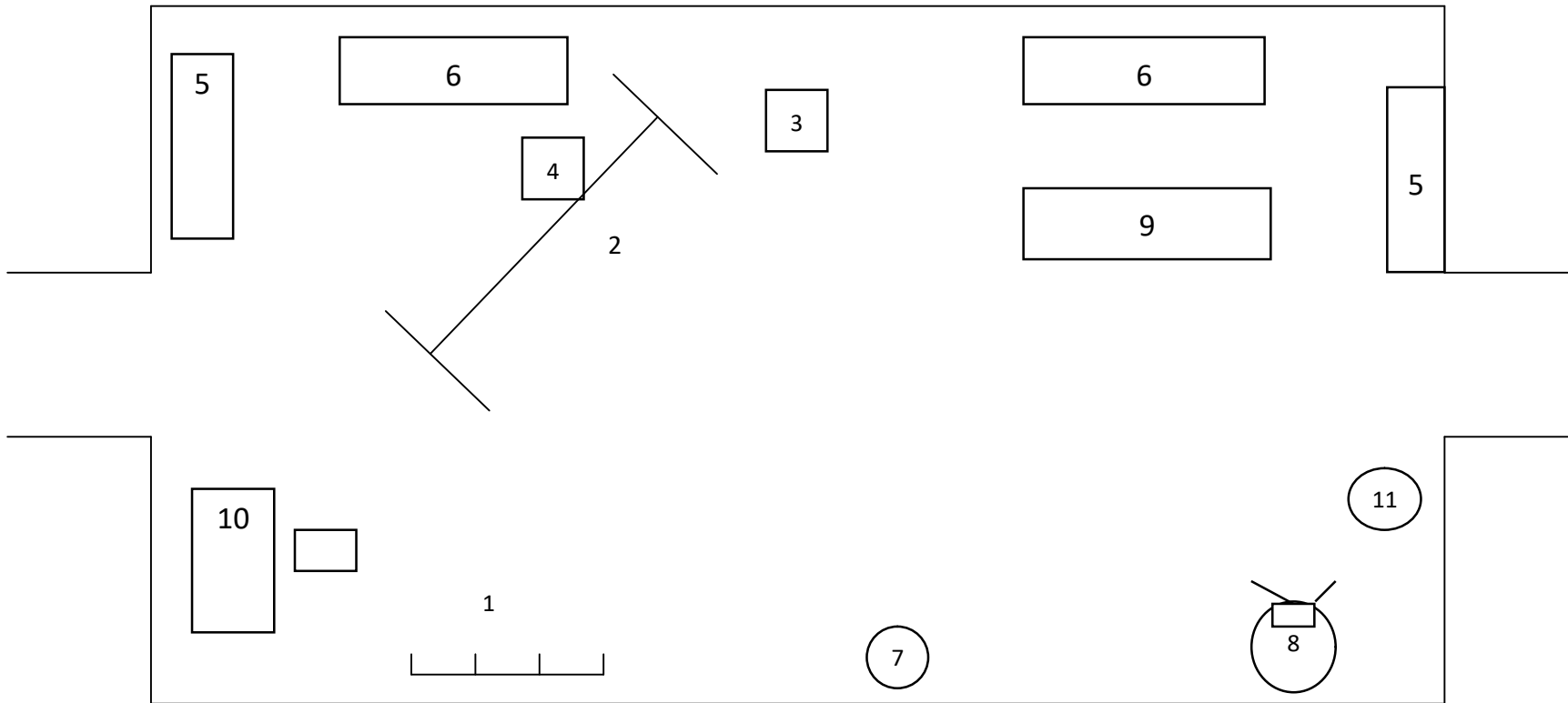
The minimum equipment of Battalion aid station

Nr. d/o	Equipment	Unit of masure	Quantity
1.	Resurcitation kit	set	1
2.	Ventilator	ps	1
3.	Monitor	ps	1
4.	Conicotomy kit	set	1
5.	Intabation set	set	1
6.	Tonometer with stethoscope	set	1
7.	Otoscope with ophthalmoscope	ps	1
8.	Pulse oxometr	ps	1
9.	UV lamp	set	1
10.	Sterilizator	ps	1
11.	EKG	set	1
12.	Defibrilator	ps	1
13.	Surgical lamp	ps	1
14.	Electric suction machine	set	1
15.	Mecanic suction machine	set	1
16.	Medical table	set	1
17.	Support for consumable	ps	2
18.	Holder	ps	2
19.	Stretcher support	set	2
20.	Pavlovschi support	ps	1
21.	Oxygen concentrator	ps	1
22.	Table	ps	1
23.	Chair	ps	1
24.	Basin	ps	1
25.	O ₂ balloon	ps	4
26.	Folding chair	ps	1
27.	Medical refrigerator	ps	1
28.	Stretchers	ps	10

The principle scheme of the Role 1 medical treatment facilities/medical detachment

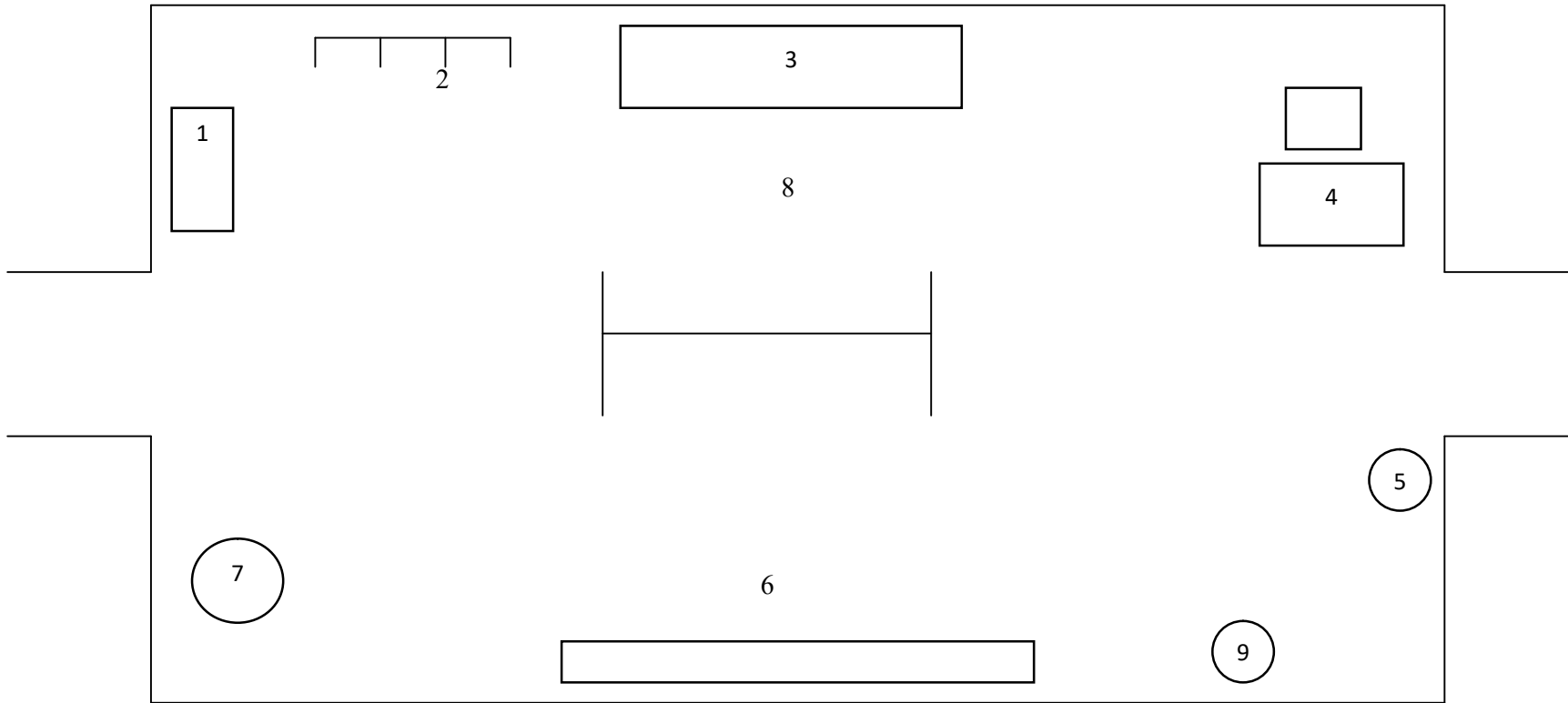


Emergency care and dressing unit



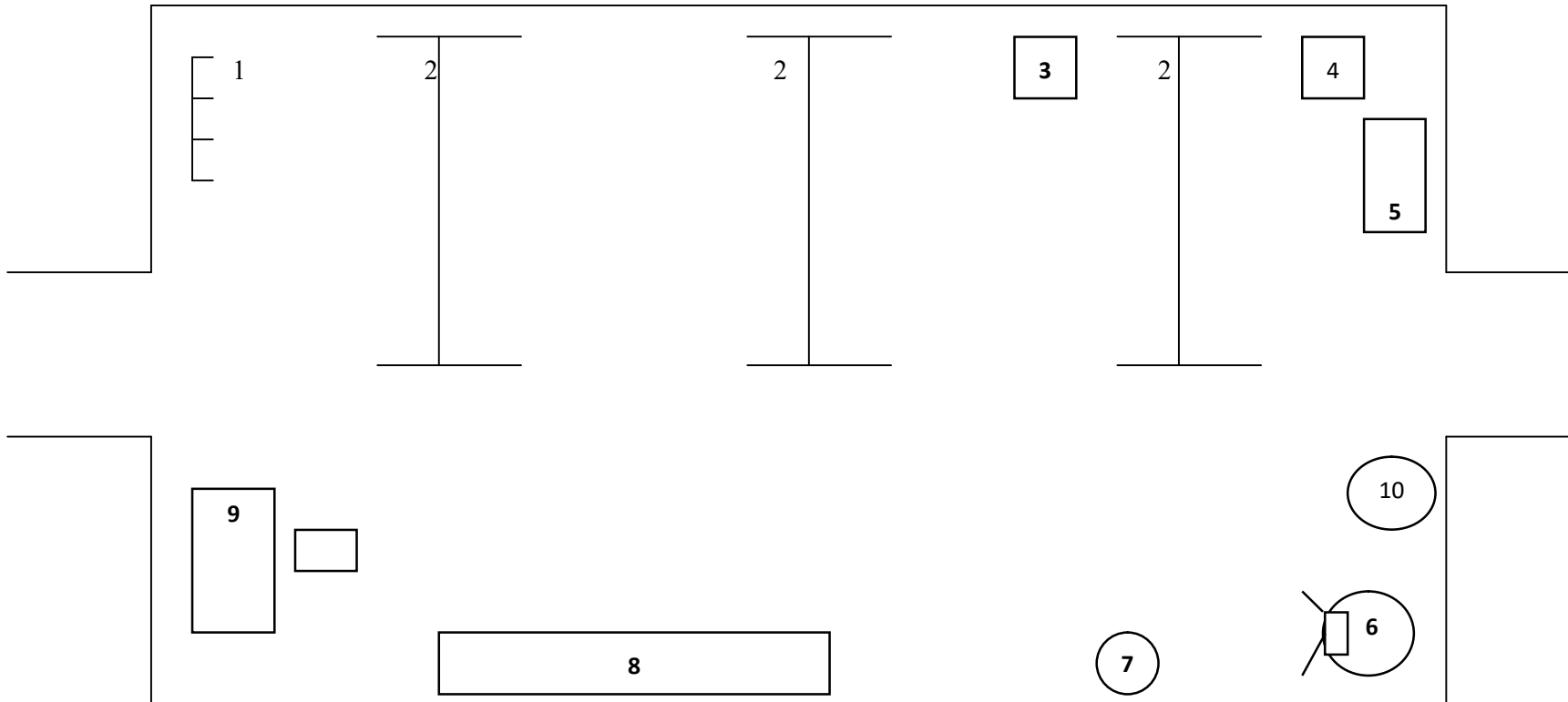
1 – hanger; 2 – stretchers support; 3 – monitor; 4 – oxygen concentrator, 5 – medical table; 6 – support for consumables; 7 – drinking water; 8 – basin; 9 – chair for injured, 10 – table with chair, 11 – climat control device.

Triage unit



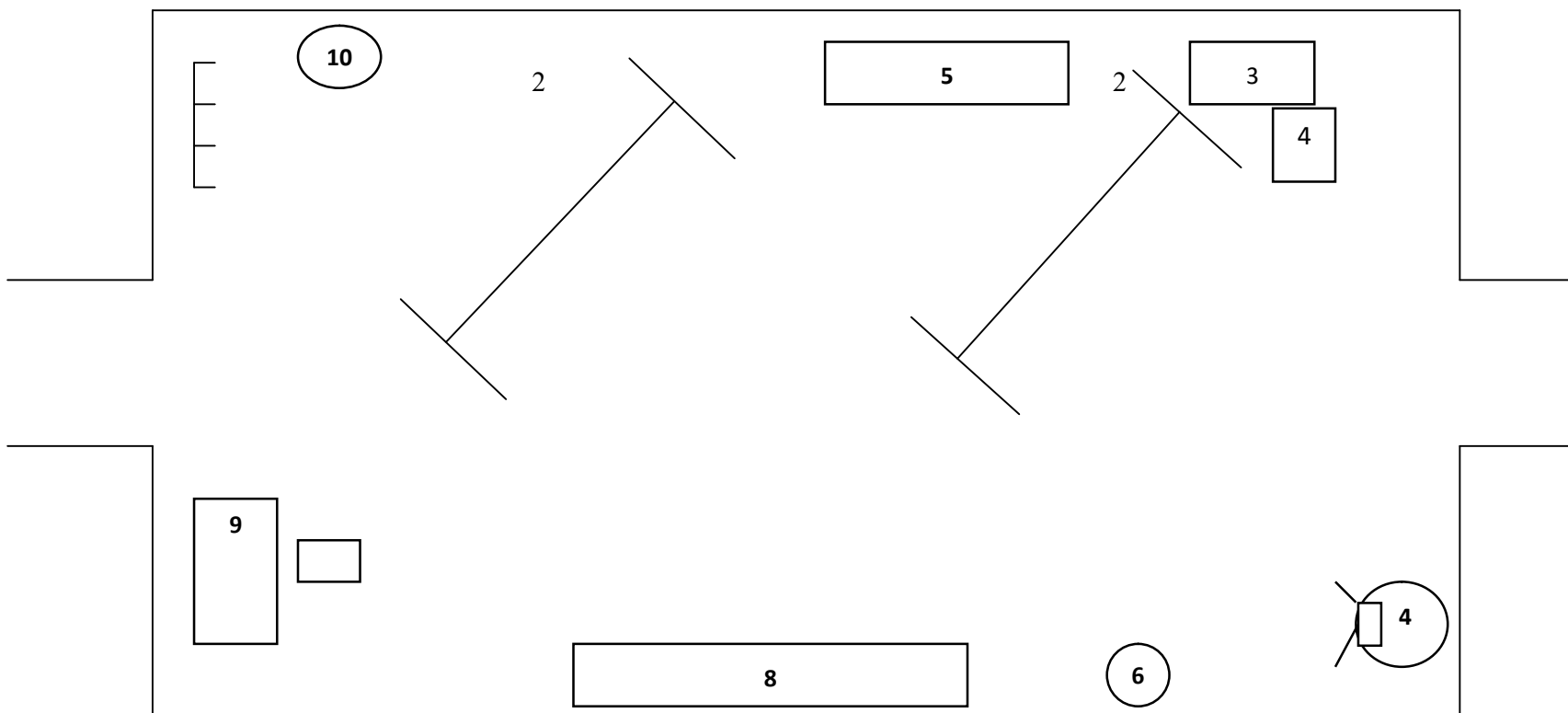
1 – weapons crate; 2 - hanger; 3 – support for consumables; 4 – table with chair; 5 – drinking water;
6 – chair for injured; 7 – lavoar; 8 – stretchers support; 9 – climat control device

Evacuation unit



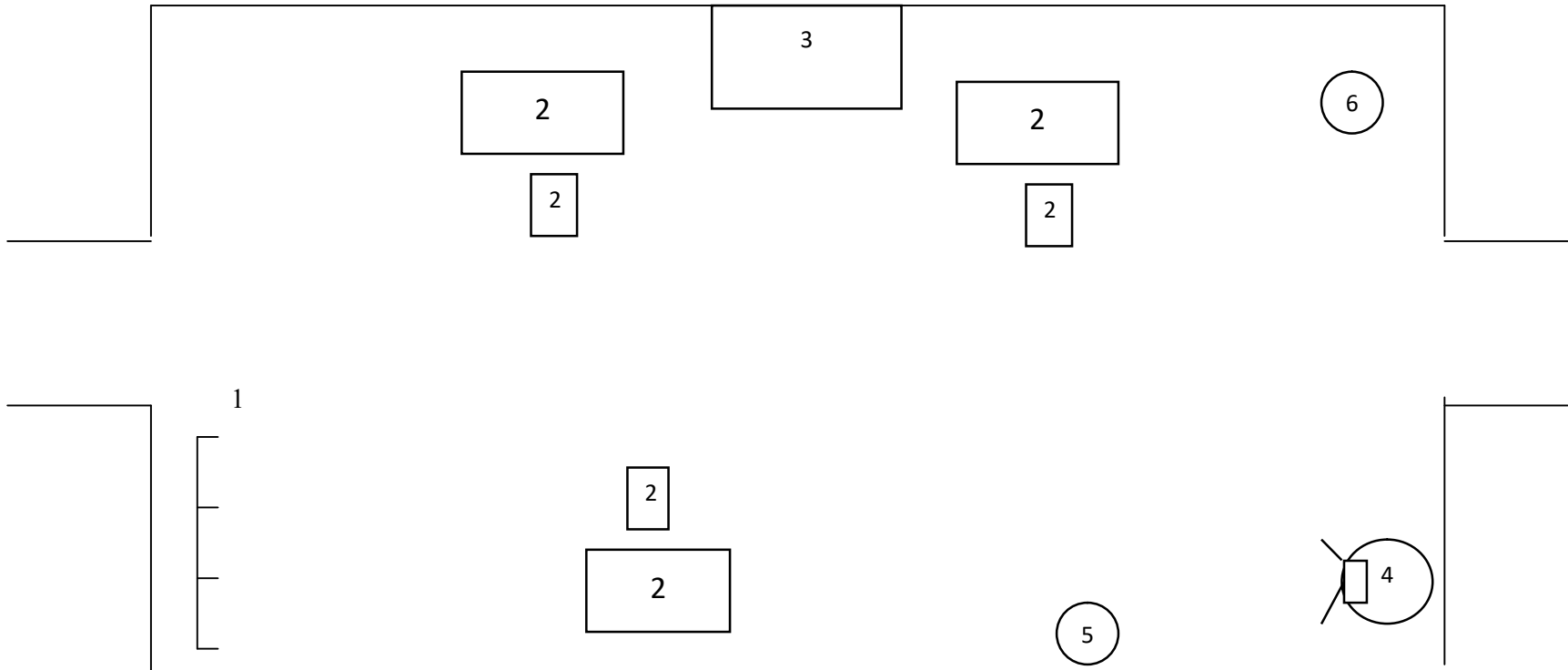
1 – hanger; 2 – stretchers support; 3 – monitor; 4 – oxygen concentrator; 5 – support for consumables; 6 – drinking water; 7 – basin; 8 – chair for injured; 9 – table with chair; 10 – climat control device

Isolator



1 – hanger; 2 – stretchers support; 3 – monitor; 4 – oxygen concentrator; 5 – support for consumables; 6 – drinking water; 7 – basin;
8 – scaun pentru bolnavi; 9 – table with chair; 10 – climat control device.

Patient evacuation coordination cell



1 – hanger; 2 – table with chair; 3- information board; 4 – basin, 5- drinking water; 6 – climat control device.

LIST OF PUBLICATIONS AND PARTICIPATION IN SCIENTIFIC FORUMS

of Mr. Sergiu Cîrlan, Department of Military Medicine and Disasters, State University of Medicine and Pharmacy "Nicolae Testemitanu", carried out for the doctor thesis in medical sciences with the theme
"Contemporary Argumantation of Medical Support in Operation",
331.03 – Social Medicine and Management

SCIENTIFICS WORKS

- **Monographs:**

1. Cîrlan S., Trofimov V., Leșan A., Marfin A., Petcov I., Dumitraș V. The Manual on Medical Support in Operation. Chisinau Implemented by Order of Ministry of Defense No 619/2019.

- **Articles in accredited national scientific journal:**

- ✓ **Articles in journals category B**

2. Dumitraș V., Cîrlan S., Marfin A., Cîrstea N., Cebotari D., Bulgac A. Department of Military Medicine and Disasters: Past, Present, and Future. In: *Public Health, Economics, and Management in Medicine*. 2018; 3(77): 64-69. ISSN 1729-8687
3. Cîrlan S. General Human and Health Losses in Contemporary Military Conflict. In: *Moldovan Journal of Health Sciences (Revista de Științe ale Sănătății din Moldova)*. 2019; 4(21): 12-18. ISSN 2345-1467

- **Journal articles in the processing of being accredited:**

4. Dumitraș V., Cîrlan S., Marfin A., Croitoru C., Ciobanu E. Medical and social aspects of floods and their medical risk management. În: *One Health and Risk Management*. 2020; 1(1): 72-79. ISSN 2587-3458
5. Cîrlan S., Dumitraș V., Marfin A., Risc management: the medical support system in contemporary armed conflict. În: *One Health and Risk Management*. 2023; 4(4): 13-18. ISSN 2587-3458

- **Summaries/abstracts/theses in the proceedings of national and international scientific conferences:**

6. Cîrlan S., Marfin A. Contemporary Approaches in the Activity of Military Medical Formations in Exceptional Situations. Collection of Scientific Abstracts of Students, Residents, and Young Researchers. Annual Scientific Conference of the "Nicolae Testemitanu" State University of Medicine and Pharmacy. Chișinău; 2019, p. 241. ISBN 978-9975-82-148-3
7. Cîrlan S., Marfin A. Medical Losses in Contemporary Military Conflict. In: Collection of Scientific Abstracts of Students, Residents, and Young Researchers. Annual Scientific Conference of the "Nicolae Testemitanu" State University of Medicine and Pharmacy. Chișinău; 2019, p. 242. ISBN 978-9975-82-148-3
8. Marfin A., Cîrlan S. Screening - an important component in the early detection and prevention of diseases in the National Army personnel. In: Collection of Scientific Abstracts of Students, Residents, and Young Researchers. Annual Scientific Conference of the "Nicolae Testemitanu" State University of Medicine and Pharmacy. Chișinău; 2019, p. 243. ISBN 978-9975-82-148-3
9. Marfin A., Cîrlan S. Implementation of Medical Insurance in the Activities of the Consultative-Diagnostic Center of the Ministry of Defense. In: Collection of Scientific Abstracts of Students, Residents, and Young Researchers. Annual Scientific Conference of the "Nicolae Testemitanu" State University of Medicine and Pharmacy". Chișinău; 2019, p. 244. ISBN 978-9975-82-148-3

10. Dumitraș V., Cîrlan S., Marfin A. Exceptional Situations and Public Health Security in the Contemporary Era. In: *Health, Medicine, and Bioethics in Contemporary Society: Interdisciplinary and Multidisciplinary Studies*. Proceedings of the International Scientific Conference, 3rd edition, November 6-7, 2020. Chișinău; 2020, pp. 302-307. ISBN 978-9975-56-805-0
 11. Bulgac A., Dumitraș V., Cîrlan S., Marfin A. The Role of Advanced Medical Treatment Facility in Disasters. In *Abstract Book*. Congress dedicated to the 74th Anniversary of the Nicolae Testemitanu State University of Medicine and Chișinău; 2020, p. 84. ISBN 978-9975-82-198-8
 12. Dumitraș V., Bulgac A., Cîrlan S., Marfin A. Training of Students and Physicians in the Field of Disaster Medicine - a Current Issue. In: *Abstract Book*. Congress Dedicated to the 75th Anniversary of the Foundation of the "Nicolae Testemițanu" State University of Medicine and Pharmacy. Chișinău; 2020, p. 118. ISBN 978-9975-82-198-8
 13. Marfin A., Cîrlan S., Dumitraș V. Activity of the outpatient center of the ministry of defense in COVID-19 pandemic conditions. În: *Materials of the National Scientific Conference with international participation "ONE HEALTH" approach in a changing world. One Health & Risk Management*. 2021; 2(4S): 89. ISSN 2587-3458
 14. Cîrlan S., Marfin A. Organizing Prehospital Medical Support in Contemporary Military Conflict. In: *Collection of Abstracts. Research in Biomedicine and Health: Quality, Excellence, and Performance*. Annual Scientific Conference of the "Nicolae Testemițanu" State University of Medicine and Pharmacy". Chișinău; 2022, p. 72. ISSN 2345-1567
- **Participation with communications at scientific forums:**
 - ✓ **international**
 15. Cîrlan S. Medical Support Concept in The National Army. *Eurasia Africa Military Medical Summit & Eropean African Military Nursing Exchange*. Germania, Garmicsh, 23-26 mai 2016.
 16. Cîrlan S. Experiența în organizarea și desfășurarea exercițiului de simulare "FALCON MEDIC 2016". *Eurasia Africa Military Medical Summit & Eropean African Military Nursing Exchange*. Germania, Garmicsh, 22-24 mai 2017.
 - ✓ **national**
 17. Cîrlan S. Sanitary Losses in Contemporary Conflict. *Annual Scientific Conference Dedicated to the 90th Anniversary of the Birth of the Illustrious Doctor and Scholar Nicolae Testemițanu*. Chișinău, 18-20 octombrie 2017.
 18. Cîrlan S. The Capabilities of Medical Treatment Facilities in Exceptional Situations *Annual Scientific Conference Dedicated to the 90th Anniversary of the Birth of the Illustrious Doctor and Scholar Nicolae Testemițanu..* Chișinău, 15-19 octombrie 2018.
 19. Cîrlan S. Contemporary Approaches to Medical Supplies at the Prehospital Stage. *Annual Scientific Conference Dedicated to the 90th Anniversary of the Birth of the Illustrious Doctor and Scholar Nicolae Testemițanu r.* Chișinău, 15-18 octombrie 2019.
 20. Dumitraș V., Cîrlan S., Marfin A. Exceptional Situations and Public Health Security in the Contemporary Era. *Health, Medicine and Bioethics in Contemporary Society. Inter and Multidisciplinary Studies*. Chișinău, 6-7 noiembrie 2020.
 21. Cîrlan Sergiu, Marfin A. Organizing Prehospital Medical Support in Contemporary Military Conflict. *Annual Scientific Conference. Research in Biomedicine and Health: Quality, Excellence, and Performance*. Chișinău, 19-21 octombrie 2022.

22. Cîrlan S., Dumitraș V., Marfin A. Medical Support in Military Conflict. *The Republic of Moldova in the Context of the New Regional Security Architecture*. Chișinău. 25 mai 2023.
23. Cîrlan S., Marfin A. Medical units' strategic management in case of CBRN incidents in Republic of Moldova. *Regional strategy for medical response as part of the disaster management in case of radiation emergency caused by the war in Ukraine*. România, București. 19-21 septembrie 2023.

Declaration on accountability

I declare the personal responsibility that information presented in this thesis are the result of my own research and scientific achievements. I realize that, otherwise, will suffer the consequences in accordance with law.

Cîrlan Sergiu

Signature

„_____” _____ 2023