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# STATUS AND PROSPECTS OF DEVELOPMENT OF MILITARY DENTISTRY IN UKRAINE

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**Key words:** military dentistry, military personnel, Joint Forces Operation, NATO standards, dental diseases prevention **Ключові слова:** військова стоматологія, військовослужбовці, операція Об'єднаних сил, стандарти НАТО, профілактика стоматологічних захворювань

Ключевые слова: военная стоматология, военнослужащие, операция Объединенных сил, стандарты НАТО, профилактика стоматологических заболеваний.

Abstract. Status and prospects of development of military dentistry in Ukraine. Lyshchyshyn M.Z., Kovalenko V.V. Providing a high level of dental care to military personnel during military activities is one of the major tasks of military dentistry. The work objective is to increase the effectiveness of the system for providing dental care to military personnel of the Armed Forces of Ukraine taking into account the experience of military operation of

the Joint Forces in the East of Ukraine in the terms and conditions of transition to Euro-Atlantic standards. It is established that in Ukraine significant changes have been introduced in the system of dental care delivery for military personnel. Dental care is provided to military personnel against extremely high dental disease incidence rate among the military personnel of the units. In the area of the operation of the Joint Forces, a new model of providing dental care to military personnel has been created and successfully operates, which is represented by a network of hospital and removable (mobile) offices. Possibilities of implementation of Euro-Atlantic dental care standards in Ukraine have been studied and the ways of their implementation in military dental institutions have been identified. Several significant differences were detected in the system of domestic dental care organization in the action area: human resourcing, extent of care and complete service facilities. A comprehensive program for prevention of dental diseases and the classification of dental health condition of military personnel which must ensure qualitative staffing of Ukrainian troops in action area has been developed. The scope of assistance has been substantiated and local clinical practice guidelines of dental care for military personnel in action area have been developed taking into account military experience gained in the area of JFO as well as NATO standards. Obtained results give the possibility to make conclusion that the principal mainstream for improvement of military dentistry in Ukraine is bringing of all aspects of its operation into conformity with relevant NATO standards taking into account own experience gained during military activities in the East of Ukraine.

Реферат. Состояние и перспективы развития военной стоматологии в Украине. Лищишин М.З., Коваленко В.В. Обеспечение высокого уровня стоматологической помощи военнослужащим во время военных действий – одна из главных задач военной стоматологии. Цель работы – повышение эффективности функционирования системы оказания стоматологической помоши военнослужащим Вооруженных Сил Украины с учетом опыта проведения операции Объединенных сил на востоке Украины в условиях перехода к евроатлантическим стандартам. Установлено, что в Украине внедрены существенные изменения в системе организации стоматологической помощи военнослужащим. Оказание этой помощи осуществляется на фоне очень высокой стоматологической заболеваемости среди личного состава подразделений. В зоне проведения операции Объединенных сил создана и успешно функционирует новая модель оказания стоматологической помощи военнослужащим, которая представлена сетью стационарных и передвижных (мобильных) кабинетов. Изучена возможность применения евроатлантических стоматологических стандартов в Украине и определены пути их внедрения в военных стоматологических учреждениях. Выявлено несколько существенных отличий в системе организации отечественной стоматологической помощи в зоне боевых действий: в кадровом обеспечении, объеме помощи и комплектно-табельном оснащении. Разработана комплексная программа профилактики стоматологических заболеваний и классификация стоматологического здоровья военнослужащих, которая должна обеспечить качественное укомплектование украинских войск в зоне боевых действий. Обоснован объем помощи и разработаны локальные клинические протоколы стоматологической помощи военнослужащим в зоне боевых действий с учетом накопленного боевого опыта в зоне ООС и стандартов НАТО. Полученные результаты дают возможность сделать вывод о том, что основным направлением к совершенствованию военной стоматологии в Украине является приближение всех аспектов ее деятельности к соответствующим стандартам НАТО, с учетом собственного опыта, накопленного в ходе боевых действий на востоке Украины.

Military dentistry is a special section of medicine that examines the organization of the provision of dental care to Armed Forces personnel in the specific conditions of their life, both in peacetime and in wartime [6]. In 2014 the dental service proved to be unprepared for tasks in today's ("hybrid") war in eastern Ukraine. Most of the military units involved in military activities did not have staff dentists. Complete and standard equipment in field conditions was not used. As a result, dental care delivery to military personnel in the area of anti-terror operation (ATO) was provided only sporadically and in urgent order [3, 8].

Dental care, with the onset of military activities in the Donetsk and Luhansk regions was carried out against the background of high morbidity of military personnel. The incidence of diseases of the oral cavity among the personnel of combat units (mobilized in 2014-2015) was about 600‰. In the general structure of sanitary losses in the first year of the war, the maxillofacial injuries made up about 6%. At the same time, almost one third of these wounds were severe and extremely severe [8, 9].

Military dentists managed to stabilize the situation and create an existing model of organization of medical care for servicemen with combat injuries and diseases of the maxillofacial area. The provision of medical care to the maxillofacial wounds is carried out in the system of modern medical evacuation measures. To strengthen the dental service, mobile dental offices were introduced in the area of joint forces operation (JFO, previously ATO) in eastern Ukraine. Close cooperation with civilian dentists has been established [4]. At the same time, the existing system of rendering dental care to servicemen needs improvement.



One of the main tasks of the Armed Forces of Ukraine, at the present stage of their development is the transition of all key functions of the defense forces to NATO standards to 2020. Almost all aspects of the Armed Forces' activity are subject to change: command structure, logistics, armaments and military medicine, including dental care as an integral part of it and much more [1, 10-15].

All of the above, in turn, determines the relevance and purpose of our work – to increase the effectiveness of the system of rendering dental care to the military personnel of the Armed Forces of Ukraine, taking into account the experience of conducting the operation of the Joint Forces in Eastern Ukraine in the transition to Euro-Atlantic standards.

### MATERIALS AND METHODS OF RESEARCH

The object of the research is the system of organization of dental care for military personnel of the Armed Forces of Ukraine at the present stage of their development.

The subject of the study is the functioning of the system of organization of dental care for military personnel of the Armed Forces of Ukraine in the conditions of JFO in accordance with NATO standards.

The program and scope of the research were determined by their purpose and main objectives. According to the program, the study was conducted in two stages. The first stage is the analysis of domestic and foreign sources of information on the state of scientific study of NATO countries on the organization of dental care in military operations.

The second phase of the work involved examining the performance of the Dental Service of the Armed Forces of Ukraine in military operations in Eastern Ukraine, as well as identifying the feasibility of implementing NATO standards to improve this assistance.

To analyze the state of dental care delivery to military personnel in the combat zone, the methods of research adopted in the military medical service of Ukraine [2], were used, namely:

- a systematic approach – for conducting quantitative and qualitative analysis of the state of organization of dental care in the Armed Forces and development of a modern system of its functioning;

- bibliosemantic – for analysis of domestic and foreign scientific sources on medical and social problems of organization of dental care for military personnel in the course of military operations in the territory of Donetsk and Lugansk regions;

- epidemiological – to determine the level of dental morbidity and the amount of necessary medical care among the servicemen in the area of the JFO;

- expert assessment – to distinguish different categories of combat and non-combat sanitary losses of troops during military operations;

- clinical, histological and instrumental methods of investigation - to identify the features of diagnosis and treatment of military personnel with injuries and diseases of the maxillofacial area. The criteria  $\chi^2$ -Pearson and t-Student were used for statistical processing of the obtained results [2].

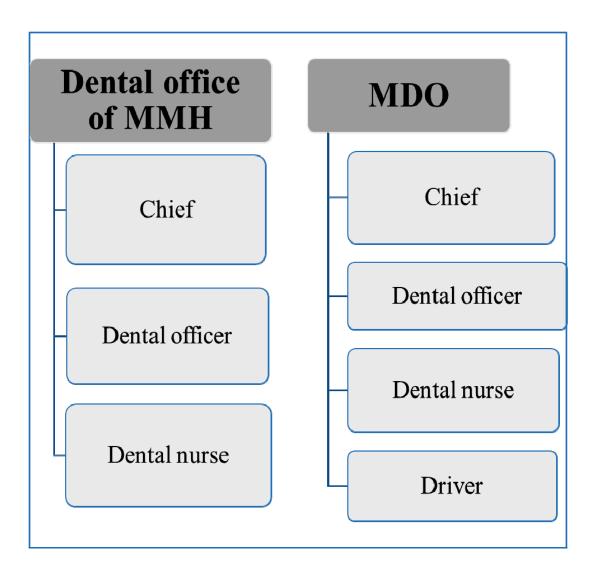
### **RESULTS AND DISCUSSION**

It is established that in Ukraine, under conditions of military aggression in the territory of Donetsk and Lugansk regions, significant changes in the system of organization of dental care for military personnel have been introduced.

Care delivery to the patients with maxillofacial wounds is carried out in the general structure of medical evacuation measures of the medical service of the Armed Forces of Ukraine, including staff dentists. Specialized treatment of such wounded patients is carried out in specialized clinics of maxillofacial surgery and dentistry of military medical clinical centers (Kiev, Odessa, Lviv, Kharkiv, Vinnitsa) and dental departments of hospitals (Chernihiv, Dnipro, Poltava, Nikolaev, etc.). A thorough analysis of the organization of care delivery to military personnel with combat injuries in the maxillofacial area will be presented in our publications.

This paper presents an analysis of the organization of medical care for servicemen with diseases of the oral cavity, i.e dental diseases. It should be noted that the provision of dental care to military personnel is carried out against the background of extremely high dental morbidity among the personnel of the units. Therefore, a considerable burden is placed on staff dentists of the brigades, who very often carry out the treatment of servicemen in difficult field conditions during the organization of JFO in Eastern Ukraine. Often this care is provided in a reduced amount, i.e. in the form of emergency dental care.

The major burden on dental care is placed on the dental service of the military mobile hospitals (MMH), which are introduced directly in the area of the JFO in the territory of Donetsk and Luhansk regions. These hospitals included mobile dental offices (MDO), which enabled to significantly improve the quality of dental care delivery to military personnel and brought it closer to the deployment points of combat units. Reinforcement of the standard dental component of MMH is scientifically substantiated (Fig.).



Organizational-staff structure of dental service of MMH

As of today, a new model of rendering dental care to military personnel has been created and is successfully operating in the area of the JFO, which is represented by a network of stationary and mobile offices. Depending on the features of functioning, provision and volume of care for wounded and dental patients, this model provides the division of dental offices involved in JFO into 3 types, with the working name of "category", since the terms "level" or "stage" for outpatient primary care facilities are, in our opinion, incorrect (Table 1).

In dental departments of military hospitals and specialized clinics of military-medical clinical centers, dental care is provided to military personnel in full, including orthopedic. Considerable attention is paid to dental activities in the complex of medical rehabilitation of military personnel from the combatants in Eastern Ukraine.

Of course, domestic military dentistry needs further improvement. The real direction of impro-

ving the level of dental care for military personnel is the approximation to NATO standards, which is one of the key national tasks in improving Ukraine's defense capability.

Dental care, as part of the military's medical supply, has received considerable attention in NATO armies. That is why, in our opinion, the approximation of Ukraine's military dentistry to Euro-Atlantic standards is a serious tool for further improvement of dental care for military personnel. At the same time, the experience gained by domestic specialists in conducting ATO/JFO in Eastern Ukraine should be taken into account.

Among all the Euro-Atlantic Alliance medical standards, three are directly relevant to the dental provision of military personnel. All standards envisage the use of forces and means in the war zone (which is the JFO in the Donetsk and Luhansk regions).

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Table 1

Category	unit	Volume of care			
		therapeutic dentistry	surgical dentistry	medical care delivery to the patients with maxillofacial wounds	in-patient treatment
III category	DO of med. company of brigade	In reduced volume	In case of emergency states	I doctor's (I level)	-
II catrgory	MDO	In full volume	Out-patient in full volume	I doctor's (I level)	-
I category	DO MMH	In full volume	Out-patient in full volume + in-patient	Quality medical care (II level)	to 10 days

Model of dental care provision to military personnel in JFO zone

The first of these is the preventive, or STANAG 2466 "Dental Fitness Standards for the Military Personnel and a Dental Fitness Classification System". It has been established that a system of comprehensive prevention of dental morbidity among military personnel has been implemented in NATO armies. The system of planned dental examinations, preventive measures and uniform standardized treatment programs makes it impossible for military personnel with acute forms of dental diseases to participate in the military actions. This standard contains a single classification of dental health of servicemen, which includes 4 groups or classes.

Analyzing the situation, it should be noted that, unfortunately, in Ukraine the programs of dental prophylaxis have been scarped both at the state level and in the Armed Forces system. There is a clear tendency to increase the level of dental morbidity among military personnel in a special period, which indicates the low quality of military medical examination.

Within the framework of Euro-Atlantic training, we have developed a comprehensive program for the prevention of dental diseases in the Armed Forces of Ukraine [4]. This program contains a list of measures aimed at improving the dental health of military personnel and a classification adapted to the relevant NATO standard (Table 2).

The key is STANAG 2453 AMedP-35 "Extent of Dental and Maxillofacial Treatment at Role 1-3", which defines the staffing, logistical support and the volume of medical care delivery to servicemen with dental diseases and injuries of the maxillofacial area at three levels (roles) that unfold in the area of hostilities. The modular approach that underlies this standard is based on an indivisible functional set of forces and resources that are selected according to the specifics of the task and operational requirements.

Table 2

Classification of dental health	of servicemen i	in NATO	partners
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DENTAL FITNESS CLASS 1	do not require dental treatment
DENTAL FITNESS CLASS 2	high probability that current dental sate will not lead to development of acute diseases of the oral cavity during 12 months
DENTAL FITNESS CLASS 3	may lead to development (or exacerbation) of diseases of the oral cavity during 12 months or unfinished dental treatment (temporary filling, temporary orthopedic implant)
DENTAL FITNESS CLASS 4	require constant follow-up, with undefined dental status, require more in-depth examination

To adapt the Dental Service of the Armed Forces of Ukraine to the stated NATO standard, it is necessary to draw attention to several significant differences in the system of domestic organization of dental assistance in the area of military operations: personnel, assistance and complete and standard equipment.

The personnel component of this standard in Ukraine can be provided. Differences in the level of training of some specialists are not significant (Table 3). Thus, the level of professional training of the dental officer (DO) and oral surgeon (OS) corresponds to the domestic dentist (general). There are no oral maxillofacial surgeons (OMFS) in Ukraine,

but dental surgeons of specialized inpatient clinics (civilian and military) successfully treat the wounded with maxillofacial injuries.

Table 3

#### Staff composition of dental service in NATO (Role1 – Role3)

Specialty	Code	Requirements
Dental officer (dentist)	DO	Licensed person (national level) to deliver dental care and/or oral surgery
Oral surgeon	OS	Licensed person (national level) to deliver dental care in oral surgery
Oro- maxillofacial surgeon	OMFS	Licensed person (national level) to deliver dental care in oro-maxillofacial surgery
Dental assistant	DA	Licensed person (national level) to assist dental officer
Oro-maxillafacial surgeon assistant	SA	Person who, according to national license and diploma, has the right to assist oro- maxillofacial surgeon

The distribution of dental professionals at different levels of care was taken into account when organizing treatment and evacuation activities in the area of the JFO and generally corresponds to STANAG 2453 AMedP-35.

It should be noted that the field hospitals (Role 3) were not established during JFO. Their function is

performed by MMCC of the Northern region (Kharkiv) and the Military Hospital (Dnipro).

An important component of the STANAG 2453 AMedP-35 is the volume of dental care at the various levels of its delivery (Table 4) and the complete and standard equipment for its provision (Table 5).

Table 4

Level	Place of delivery	Type of dental care	Who delivers
Role 1	squadron-brigade	Emergency dental care	DO/OS DA
Role 2	mobile hospital	Primary dental care	DO/OS DA
		Oral surgery	DO/OS DA/SA
Role 3	field hospital	Secondary dental care	DO DA
		Oro-maxillofacial (OMF) surgery	OMFS/OS SA

Volume of dental care in NATO (Role 1-Role 3)

In accordance with this NATO standard, Level 1 provides emergency dental care. The volume of this care in Ukraine needs clarification. As part of the

implementation of the Euro-Atlantic standards, we have developed local clinical protocols that meet 3 levels of dental care in the area of JFO [3].

In order to adapt to the NATO standard, we have to substantially change the contents of the existing complete and standard equipment and create new modern sets (modules). Existing domestic S (stomatological) and GK (gnathic kit) kits only partially correspond to 5 NATO modules.

Table 5

Module	Level	In Ukraine (kit)
Emergency dental care	Role 1	-
Primary dental care	Role 2	S
Dental alveolar surgery	Role 2	S (partially)
Secondary dental care	Role 3	-
Oro-maxillofacial (OMF) surgery	Role 3	GK

## Module equipment of dental care in NATO

The third dental standard – STANAG 2464 AMedP-3.1 "Military Forensic Dental Identification" provides for the involvement of the dentist in the forensic examination process and emphasizes current internationally recognized protocols and procedures for identifying a person through oral cavity research.

In Ukraine, in order to meet the requirements of this standard, it is necessary to introduce legislative changes to allow the admission of military dentists to the forensic examination process in the area of military actions.

In order to create a single electronic database of orthopantomograms for all servicemen in the future, it is necessary to equip all hospitals and MMCC with modern digital dental x-ray equipment. This will not only realize the direct destination of STANAG 2464 AMedP-3.1, but will also significantly increase the clinical and diagnostic capabilities of military dental units in Ukraine.

#### CONCLUSIONS

1. It has been found that the existing model of dental care delivery to the Armed Forces servicemen in the area of the JFO was improved by augmentation of staff composition of offices of MMH and introduction into their staff of regular mobile dental complexes, which made it possible to increase the effectiveness of this assistance and to make it more accessible for individuals. fighting in the Donetsk and Luhansk regions.

2. The main focus on improving military dentistry in Ukraine is to bring all aspects of its operations closer to the relevant NATO standards, taking into account the experience gained during the ATO/JFO.

3. Developed, taking into account the relevant NATO standard, the "Armed Forces Dental Health Program for the Armed Forces" aims at reducing dental morbidity among the Armed Forces personnel. The classification of dental health status created under this program should ensure the qualitative configuration of Ukrainian units that will be involved in the war zone.

4. The volume of dental assistance to military personnel in the combat zone is justified, taking into account the experience gained in the area of the JFO and NATO standards. Local clinical protocols of dental care delivery to military personnel have been developed and adapted to the real conditions of military operations in Eastern Ukraine, taking into account the relevant Euro-Atlantic standard.

5. New dental assistance kits are required to be created in the combat zone, which meet NATO standards and provide up-to-date dental care to military personnel.

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