PfPC
PARTNERSHIP FOR PEACE CONSORTIUM

INFORMATION PAPER
on
Ukraine Military Medical Training & Education Requirements

This paper will be distributed through the Partnership for Peace Consortium (PfPC) to national representatives and organizations of interest.

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SUBJECT: Training & Education in War: Ukrainian MILMED Requirements

Purpose

To provide background on Ukraine's Military Medicine (MILMED) experience and gaps in distributed training and education during war; to identify requirements and scalable principles to better coordinate training and education security cooperation for effective force employment; and to offer recommendations to NATO, the EU, UN, and nations to make national and multilateral improvements in assisting Ukraine MILMED education and training.

The recommendations are for specific actions related to Ukraine, but the principles behind the recommendations apply to Allies and Partners in general and should inform NATO-wide efforts to enhance preparedness through distributed learning in force education and training. See **Annex A-C** for further detailed background information.

Introduction

The Partnership for Peace Consortium's (PfPC) Advanced Distributed Learning (ADL) Working Group convened a workshop, "Distributed Learning in War," on September 5-6, 2023, with the NATO Centre of Excellence (COE) for MILMED in Budapest, Hungary, and the Director of the NATO MILMED COE, Colonel Dr. László Fazekas.

A panel of 41 civilian and military distributed learning experts from 18 NATO and Partner Nations and Organizations, including Ukraine, analyzed technology-enhanced learning relevant to Military Medicine in wartime. See further acknowledgements in **Annex D**.

BLUF

Ukraine Military Medicine requires learning solutions, short- and mid-term, that enable effective training and education to meet current and post-war Armed Forces of Ukraine (AFU) operational requirements. Allies and Partners require immediate coordination and accountability to provide more efficient and effective means of delivering such capabilities to the AFU and across partnerships. Some vital AFU Military Medicine training and education requirements can be met by improved distributed learning capabilities.

Problem

The AFU has an urgent demand for additional MILMED personnel across all levels and specialties. However, there are limited available faculty and staff to support the required training and education to meet AFU operational readiness. The EU Military Assistance Mission in support of Ukraine (EUMAM) provides some basic, advanced, and specialized medical training to AFU, but the scope of this training is limited considering the scale of the war.

The Ukrainian Military Medical Academy (UMMA) aims to increase and improve its use of eLearning for both medical professionals (e.g., personnel in UMMA's academic programs) and field medicine specialists (e.g., first responders) who perform tactical medical tasks.

Desired Outcomes

The efficient use of distributed learning will provide more timely and cost-effective delivery of MILMED training and education at the Point of Need (PoN); enable delivery of just in time (JIT) training in the field environment at the PoN; offer increased access to learning content both synchronous and asynchronous; and scale the reach of UMMA faculty, allowing sustainable and programmatic support to more learners without compromising academic quality.

Ultimately, UMMA seeks to deliver effective, cost-efficient, flexible, NATO-accredited learning with personalized user experience (UX) that will adapt to individual learning competencies with agile acquisitions in updated learning modules based on new requirements and lessons learned.

Recommendations

The following recommendations will overall support the AFU's Military Medicine training and education, and strengthen the Alliance and Partners in a more sustainable plan and operations:

A. Identify a single coordination entity within NATO for strategic, operational, and tactical training needs of military and civilian healthcare services delivered by nations (NATO and Partners), in coordination with EU Military Staff (EUMS) and the EU Military Assistance Mission in support of Ukraine (EUMAM).
B. Establish an agile information-collection and sharing system to capture MILMED data (observations/lessons) and make it available to support the short-term training needs of partner and NATO nations in a range of military operations or disasters.
C. Develop a process for creating sharable medical educational materials on request for a wide range of medical capabilities, from self and buddy aid through the military and civilian continuity of care.
D. Develop, distribute, and/or validate situationally dependent MILMED training and educational materials that are adaptable and interoperable with varying national standards, local procedures, and native languages.
E. Identify the process and governance of data collection and educational materials preparation for NATO verification/validation/certification of MILMED educational and training organizations and content.

Actions

1. US Joint Staff J7 JKO (Joint Knowledge Online) is to provide a list of ADL course descriptions of Defence Health Agency medical content to UMMA NLT 12/31/2023. UMMA will provide a consolidated list of priority content as soon as possible, based on UMMA requirements, for enrollment on JKO. The process will then continue to define the transfer, release, and hosting of the data.

2. US Joint Staff J7 JKO will reach out to US Army TRADOC (Training and Doctrine Command) to obtain a list of ADL course and microlearning descriptions covering medical content, to be handed over to UMMA NLT 12/31/2023. UMMA will provide a consolidated list as soon as possible of priority content, based on UMMA requirements, for enrollment on JKO. The process will then continue to define the transfer, release, and hosting of the data.

3. NATO ACT (Joint Force Development) is to provide a list of ADL course descriptions of medical content to be handed over to UMMA. UMMA will provide a consolidated list for enrollment on NATO School ADL (suggested), based on the UMMA requirements, NLT 12/31/2023. The process will then continue to define the transfer, release, and hosting of the data.

4. NATO ACT (Joint Force Development) will investigate the technical and legal possibility of conducting a microlearning (NeNA) experiment with UMMA. ACT will provide an answer NLT 1/31/2024. If the response is positive, the process will continue to define the Terms of Reference and timeline between UMMA and ACT.

5. UMMA is to open dialogue with NATO SHAPE (Medical Support Discipline Requirements Authority) to be followed by coordination with the Medical Support Discipline Department Head and Military Medical Center of Excellence (MILMED COE). Main requirements are the release of documentation and guidance to support conforming UMMA courses to NATO standards for evaluation, quality assurance, and course certification.

6. PfPC to dialogue with UA Regional Program Lead at DSCA ISG (DOD Security Cooperation Agency Institute for Security Governance) to determine what DSCA/ISG support has been/is being provided to Ukraine in training and education for military medicine and determine what more can be done.

7. UMMA to coordinate with the NDU of Ukraine NLT 12/31/2023 to share experience and best practice for hosting courses, administration, train the trainers, translation, analytics and more. The outcome will develop additional requirements and solutions.

8. PfPC should serve as a coordinating agency (US/Allies and Partners, and Multinational org's) to facilitate cooperation in distributed learning to connect Ukrainian organizations communicating needs more effectively to Allies and Partners who coordinate and provide solutions. This will include support to the action points above.

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ANNEXES

Annex A: Background

Annex B: AFU Distributed Training and Education.

Annex C: Training of Military personnel in UA Military Medical Academy

Annex D: Acknowledgements

ANNEX A: BACKGROUND

This annex provides a background summary of Ukrainian Military Medicine's collective and individual training situation, with a focus on distributed training and education, as discussed and addressed with the PfPC ADL WG international experts.

The war in Ukraine exemplifies the essential role of security cooperation among Allies and Partners in effective force employment. During operations, the Armed Forces of Ukraine (AFU) relies on continuously adapted training and education, adjusted to current lessons identified and just-in-time assistance delivered via technology-enhanced learning. This meets urgent requirements for training military recruits, cadets, non-commissioned officers, officers, reservists, and civilian staff on military medicine in war for all roles and at all levels.

The Ukrainian Military Medical Academy (UMMA) provides basic and advanced training and education to all medical personnel supporting the Defense Forces. UMMA also trains and educates foreign specialists, medical reserve officers from other institutions, and students from Ukraine's Bogomolets National Medical University who support the reserve peacekeeping forces. UMMA is the only MILMED higher education institution in Ukraine; it supports all organizations across the defense and security sectors.

The Ministry of Health of Ukraine supervises UMMA, in accordance with the State Law in Public Health. UMMA courses adhere to the minimum qualification standards defined in Ministry of Health Protectorate of Ukraine Order 25.11.2022 № 2136, "On the approval of the List of cycles of specialization and thematic improvement in medical and pharmaceutical (pharmacy) specialties."

Prior to 2015, Ukrainian MILMED was underdeveloped. No combat medic position existed. There were no training centers or instructors of combat medicine, and the only medical training company closed in 2010. The AFU also lacked suitable medical supplies (e.g., first aid kits) and medical staff in their units. In 2015, the AFU undertook new efforts to establish permanent and sustained readiness for its MILMED forces—in the shortest possible time for all positions of military medical personnel. Special attention was given to Role 1 preparation (i.e., unit-level care such as resuscitation, disease prevention, and lifesaving measures).

In February 2022, Russia invaded Ukraine in an escalation of the war that began in 2014. This prompted UMMA to accelerate graduation of its students, provide additional training to civilian medical personnel to enable their support of the Armed Forces, and move its base of operations from Kyiv to Vinnitsa. (The Academy returned to Kyiv in September 2023).

Today, UMMA provides education, training, and continuous development across thirteen academic departments, and UMMA's Research Institute of Military Medicine conducts fundamental and applied scientific research in six areas. Almost 80% of UMMA instructors have participated in the war in Eastern Ukraine. They now bring this experience into the educational process. In addition to on-site training, the practical phase of Academy training programs is now frequently conducted in military mobile hospitals.

UMMA coordinates actively with the international community, including the NATO Centre of Excellence for Military Medicine (MILMED COE). UMMA has been in direct contact with the MILMED COE regarding the possibility of pursuing accreditation as a NATO-approved Education and Training Facility (ETF) in coordination with Allied Command Transformation (ACT). To achieve this, all UMMA course content will need to meet NATO quality management standards.

Despite many successes, the AFU faces ongoing military training and education challenges, primarily from the inability to conduct in-resident training and education at pre-war levels. Ukraine needs improved infrastructure for distributed learning to support both immediate and mid-term force development—and, ultimately, civil-military based national resilience.
AFU members presented the PfPC ADL Working Group with anecdotal evidence of the need for better coordination of security cooperation efforts in force MILMED education and training. This is an area where processes and institutions can be meaningfully strengthened at relatively low cost.

Enhanced cooperation in distributed learning can yield significant return on investment in both the current and post-war environments, benefiting the AFU today and Partners in the future through scalability, adaptability, and reusability. Sustainable solutions must be systematic, streamlined, and include civil-military cooperation to support national resilience. There are numerous NATO, EU, and national initiatives that provide training and education support to Ukraine[1]. Any enhanced security cooperation in force education and training ought to work with these existing efforts across an ecosystem that considers multilateral partnership contexts.

UMMA eLearning Assistance Requirements

Digital Content

UMMA seeks relevant digital media on the range of topics for which it provides training and education. Content is needed for first responders and civilians without a medical background (e.g., emergency first aid). Full-length courses are welcome, but microlearning such as short videos and checklists are particularly useful. Materials should be accessible in austere, degraded environments where internet connectivity is not guaranteed. Once UMMA is recognized as an accredited ETF, Ukraine's state quality management and curriculum standards must align with NATO education and training policies and Bi-Strategic Command (Bi-SC) directives. For now, all content must be translated into Ukrainian by translators fluent in medical terminology. AFU's translation resources are decisively engaged and not available to support training and educational content.

Technical Infrastructure

UMMA lacks sufficient technological infrastructure for distributed learning. UMMA requires assistance in implementing the software, hardware, and network capabilities needed for eLearning. These include security, hosting, content management, data handling, and analytics capabilities. Assistance may include training to upskill UMMA personnel, remote hosting, and/or equipment. UMMA aims to employ user-friendly automation to reduce the administrative burden on staff (e.g., in the student onboarding process).

Staff Assistance

UMMA and the UMMA DLO&S group are understaffed. UMMA personnel seek direct assistance from subject-matter experts to better:

- capture and incorporate national and partner lessons identified into e-content;
- develop a repeatable process for creating/requesting new MILMED e-content;
- implement interoperable technologies and courseware;
- translate donated learning content from foreign languages into Ukrainian; and
- perform NATO accredited MILMED quality assurance (QA) on e-content.
- Train UMMA faculty and staff on how to best develop, use and manage eLearning,
- Develop train-the-trainer lesson plans to facilitate blended learning at remote locations,
- Help teachers, decision-makers, and commanders embrace eLearning.

[1] For a detailed list of these initiatives, see: *Training while we fight: Lessons from Ukraine's use of distributed learning in war*, PfPC ADL Working Group Info Paper, Skopje, March 2023.

ANNEX B: AFU DISTRIBUTED TRAINING AND EDUCATION

The background information in this Annex is provided by Colonel Maksym Tyshchenko, Ph.D., Chief of the Scientific Distance Learning Centre at the National Defense University of Ukraine (NDUU). It describes the challenges the AFU faces related to training and education supported by distributed learning. The Annex also presents the main challenges for NATO Allies and Partners in providing relevant support.

General

Training and education are typically viewed as what we do to prepare for war, and Ukraine is a golden example: Ukraine's force development methods were a fundamental delta between the Armed Forces of Ukraine (AFU) of 2014 and the AFU of 2022. During that period, Ukraine made substantial progress related to its NATO interoperability and curricula compliance, including the following achievements:

1. First military education system institutional audit in the Ministry of Defence of Ukraine, involving US, Canadian, Danish, German, and Lithuanian subject-matter experts (2020)
2. Roadmap for Language Training Enhancement in the AFU for 2021-2025
3. Policy of the Ministry of Defence of Ukraine in the Realm of Military Education (2021)
4. Law of Ukraine "On Amendments to Certain Laws of Ukraine on Military Education and Science"
5. Resolution of the Cabinet of Ministers of Ukraine for the "Concept of Transformation of the Military Education System"
6. Update of the AFU curriculum, in compliance with the NATO standards

Ukraine also shows us that training and education are essential capabilities during a sustained fight. Ukraine has combined the creative use of eLearning and localized partner-nation content to quickly adapt its training and education offerings to address the changing battlespace, shifting mix of weapons systems, and influx of new personnel. While at war with Russia, the AFU has continued to provide training and education to military members throughout their careers; and the AFU continues to pursue higher-level ambitions, including ongoing reforms to their PME systems to bring them further in line with NATO standards and doctrine.

Current goals for the AFU's training and education modernization include:

1. Ongoing commitment to Euro-Atlantic integration.
2. Establish a PME system that enables NATO officers to study in Ukraine.
3. Create up-to-date leadership curricula based on the lessons learned from the Russia-Ukraine War.
4. Develop faculty capable of teaching using the methodologies adopted by NATO (including teaching NATO planning, decision-making methods, and leadership in accordance with [IAW] NATO PME standards) and capable of teaching at NATO military education institutions.
5. Empower the best commissioned officers and non-commissioned officers (NCOs) with real combat experience to serve as mentors in the PME system.
6. Create an educational environment that motivates service members to continuously self-improve.
7. Ensure the AFU is manned by service members trained and educated to NATO standards.

AFU Distributed Training & Education

This section is informed by Colonel Maksym Tyshchenko, Ph.D., Chief of Scientific Distance Learning Centre at NDUU. This section describes the challenges for AFU, particularly to training and education supported by distributed learning.

The war has created many challenges for AFU's distributed learning capabilities.

First, immediately after 24 February 2022, the ADL staff who would typically support AFU's distributed learning systems were assigned to combat missions, in turn reducing the availability of system administrators and helpdesk operators. Simultaneously, administrative requirements surged as tens of thousands of new personnel sought access to learning materials. At the war's start, this imbalance of staff resources limited accessibility to distributed learning resources. With time, the situation has stabilized, but administrative staff continue to face high demands, with little slack in their schedules.

Second, Ukraine's distributed learning infrastructure is a target of war. Some of the PME institutions were forced to relocate their ADL platforms to continue operations. For other PME institutions, the war resulted in damage to or destruction of their infrastructure. Intermittent electricity and internet connectivity problems across the nation also create access issues.

Third, Russians use personal information to threaten or kill Ukrainian citizens. Personal data handling is extremely sensitive. If adversarial actors obtain personal data, it may lead to the terrorizing of those users' relatives, persecution of the users directly, and even their murder. Consequently, the data stored in distributed learning systems must be absolutely protected or omitted entirely.

Finally, the delivery of digital learning materials is disjointed within the AFU across a variety of open, off-the-shelf services. In addition to AFU's Moodle Learning Management System (LMS) and eLibrary, both of which are supported by NDUU, the AFU are using other PME's institutions, LMSs, YouTube, Signal, Telegram, and more. This facilitates access to content but results in a lack of coherence across resources and creates "technical debt" that will be difficult to maintain effectively in the future.

Challenges in Distributed Learning Cooperation

Our current security cooperation systems were not built to support the kinds of education and training coordination that Ukraine currently requires, both for its wartime effort and its post-war ambitions. While security cooperation frameworks excel at transferring equipment, they are less prepared to deliver relevant, interoperable training and education to a Partner engaging in conflict.

A wide range of temporary collaborations with civilian and military academic institutions are striving to bridge this capability gap, and while the multinational response to support Ukraine has been dynamic, sustainable solutions must be systematic and structural. The many entities providing direct support are not necessarily aware of the others. This leads to gaps, duplications, and confusion.

Coordination is required to ensure effective ongoing support that covers all required areas, avoids duplication, and ensures that all provided components work effectively in combination—without putting undue burden on Ukrainian organizations trying to navigate the disparate aid they are receiving. The AFU has further identified the following challenges related to security cooperation assistance related to distributed learning:

- The AFU has insufficient distributed learning materials to support training on new armament items and vehicles. Any delivered weapon system or other capability should include related distributed learning content, such as eLearning, microlearning, and/or mixed reality materials.

- The AFU has limited access to digital learning assets from Partners and/or a lack of awareness of the available assets and requirements for using them within the Ukraine defense sector. This is at least partially an information and coordination problem. There are willing Partners with available distributed learning resources that are largely unknown to Ukraine.
- The AFU's mechanisms for delivery of distributed learning support are ad hoc.
- The lack of standards, interoperability, coordination, and structured cooperation often limits sharing of available materials and content.
- In the long term, the AFU aims to reach NATO standards, including English-only courses. For now, language translation into Ukrainian is required, but the AFU's translation resources are currently dedicated to the operation of delivered weapons systems. These resources are limited and disjointed for translation of training and educational content. Support for courseware translation is required.
- In the long term, the AFU aims to build and implement a modern learning ecosystem aligned with the Total Learning Architecture, but the AFU lacks analyses on practical implementation of this sort of enterprise learning architecture. For instance, what kinds of solutions are required, what are the legal and regulatory requirements, and what should the work plan look like for selecting and implementing solutions and services?

Solutions

In the short term, sharing and adapting existing courseware to meet Ukrainian needs can help meet the AFU's most urgent training and education requirements. All near-term solutions must be survivable, agile, interoperable, requirement-driven, and usable:

1. **Survivable**: Resilient to damage and destruction (e.g., cloud-based, cybersecure, flexible)
2. **Agile**: Adaptable to meet the needs and pace of battle—driven by empirical data
3. **Interoperable**: Adherent to technical standards for cross-system sharing and modular architectures
4. **Requirement-Driven**: Focused on the topics and delivery modes currently required by Ukraine.
5. **Usable**: Easy for users to acquire, implement, find, and complete the instruction

A longer-term response is to help Ukraine develop the skills and facilities to support a resilient distributed learning enterprise more fully. This can be accomplished through train-the-trainer courses, increased Ukrainian participation in formal residential and online courses at NATO and national learning institutions, the receipt of formal qualifications from NATO/Partner institutions, and formal recognition of Ukrainian and European military education facilities.

Another longer-term goal is to learn lessons from this war that can help Ukraine, NATO, Partners and Nations learn how to improve the efficiency, resilience, and adaptability of training and education systems—especially during war situations. This war has provided a crucible of lessons and innovation that would have otherwise taken years to uncover. Workshops to share lessons learned (such as the February 2023 PfPC "Distributed Learning in War" workshop) are worthwhile.

An initial, running list of some lessons related to distributed learning from the AFU include the following:

1. When staff is limited, develop processes of automation.
2. Use a cloud solution to mitigate infrastructure limitations.
3. Personal data has to be well protected or simply not used.

4. Access to materials and content requires a structured approach that involves curating authoritative information, and this process must be supported by existing and new partnerships.
5. The format of digital materials needs to be standardized to facilitate re-use and interoperability.
6. Resources are limited. Interoperability, translation, and quality-assurance are critical.
7. Capture and incorporate both national and partnership lessons.

Conclusion

The Russia-Ukraine war has spotlighted the importance of our collective commitment and the value of interoperability—as well as the shortcomings in our security cooperation systems relative to distributed training and education. While this is in many ways a war that turns on training and education, we have much to learn from both the perspective of national systems and the perspective of partnership and interoperability in our force development systems.

The character of warfare has fundamentally changed, to include the way militaries and homeland defense organizations must rapidly learn and adapt during a war. Understanding these lessons from the Russia-Ukraine war cannot only help NATO better support the AFU in its current fight; this coordination also forms a vital two-way path, helping NATO, Allies, and Partners to collaboratively improve by learning and resolving these critical lessons. Enhanced NATO participation in this process is crucial.

Training and education must be a principal component of security cooperation. NATO, the EU, Allies, and Partners can—and must—elevate our collective readiness and military modernization to address future fights, while also providing support to Ukraine in its moment of need. The concerns and recommendations outlined in this Information Paper provide a path toward achieving both.

ANNEX C: TRAINING OF MILITARY PERSONNEL IN THE UKRAINIAN MILITARY MEDICAL ACADEMY (UMMA)

This Annex is based on the AFU delegation's presentation at the PfPC ADL Working Group's September 2023 meeting in Budapest. Additional information can be found on http://uvma.mil.gov.ua/.

Introduction

The Ukrainian Military Medical Academy (UMMA) is the military medical institution of higher education in Ukraine tasked with training and advanced training of military medical personnel for all Defense Forces, as well as foreign specialist and reserve officer students of the medical service.

This figure illustrates the UMMA's main organization:

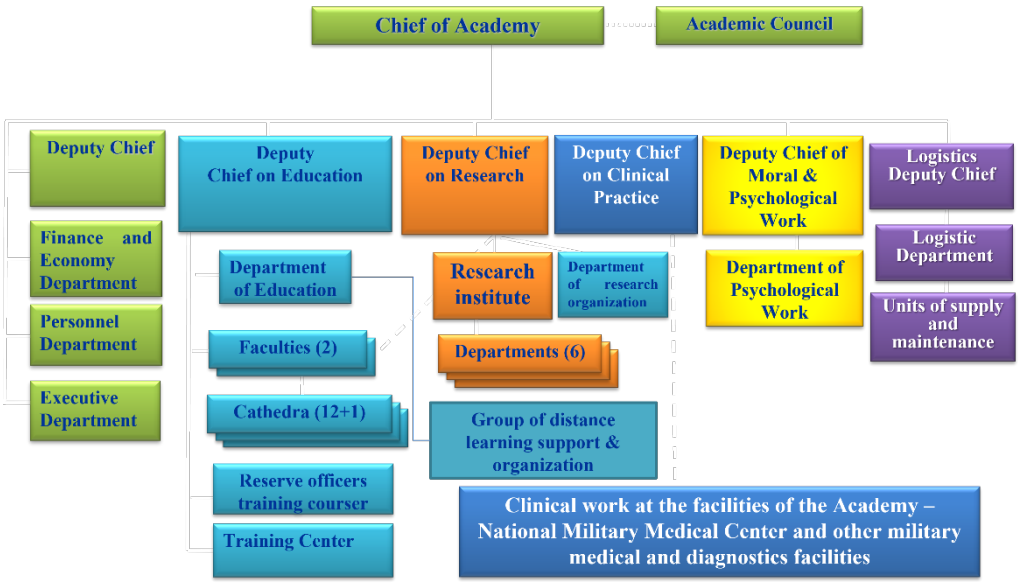

Figure 1

The Research Institute of Military Medicine has six scientific departments which conduct fundamental and applied scientific research in the following areas:

1. Development of scientific and methodological bases for planning and organization of medical support of the Armed Forces of Ukraine in peacetime and wartime.
2. Medical supplies for peacetime and a special period.
3. Medicine of military work, hygienic regulation, anti-epidemic and biological protection of military personnel of the Armed Forces of Ukraine in peacetime and a special period.
4. Scientific and technical support for the creation and modernization of medical equipment.
5. Special medicine and substantiation of measures for improvement of the system of psychophysiological support of troops (forces) activity in peacetime and special period,

professional selection (aptitude), and functional state monitoring and psycho-medical rehabilitation).

6. Medical standardization and metrological support.

This figure illustrates the Institute's organization:

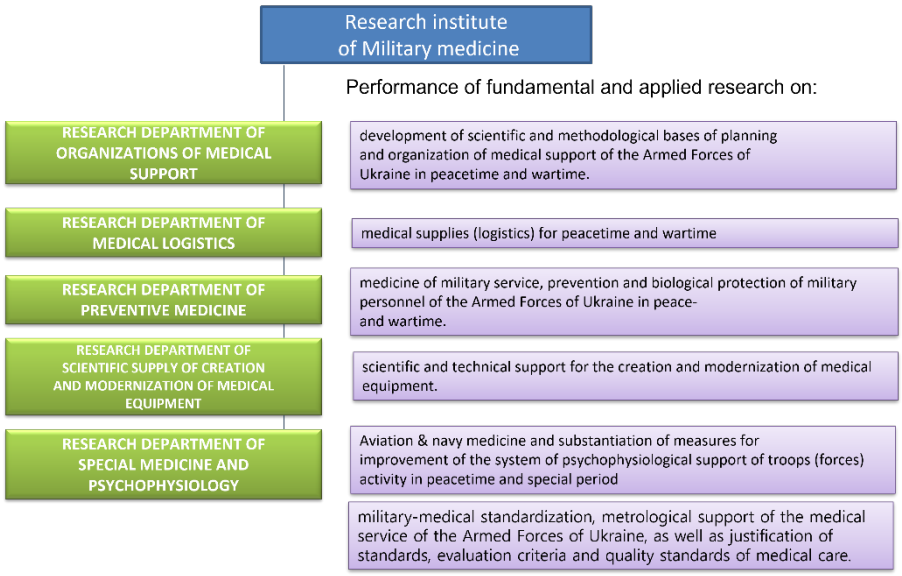

Figure 2

This figure illustrates the UMMA's educational sub-divisions:

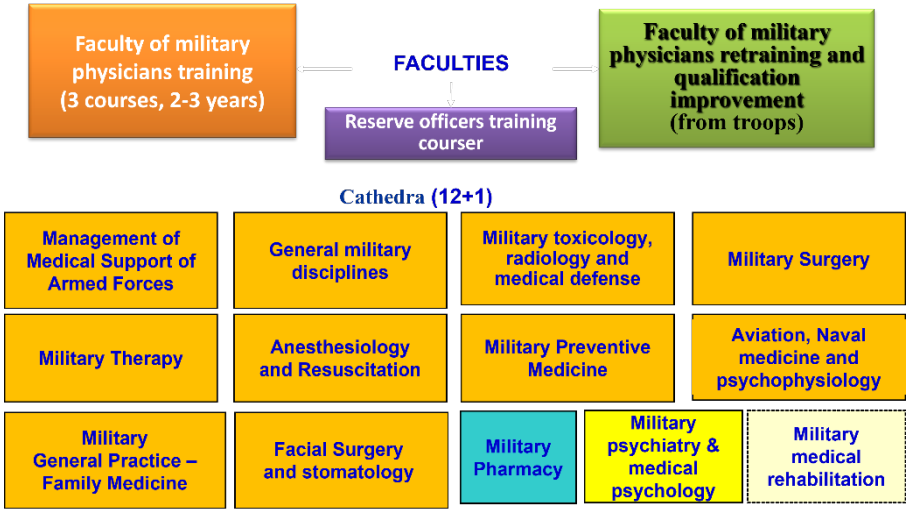

Figure 3

Reality After FEB 2022

The reality for medical training and education after FEB 2022 is that it dramatically affected the UMMA's way of operating:

- Early graduation of alumnae
- Additional training of reservists (civilian medical personnel for the needs of Armed Forces)
- UMMA relocation from its permanent location to Vinnitsa
- Late August 2023, UMMA return into Kyiv

UMMA's Main Activities

The UMMA undertakes the following main activities:

- Postgraduate training of specialist with higher education and qualification level; Master of Medicine or (Pharmacology) (up to the end of 2024) by assigning them to a specialist qualification in medicine (or Pharmacology) with a specialty of 14 medical occupations for the Defense forces of Ukraine, the Ministry of Internal Affairs of Ukraine, National Guard of Ukraine, State Border Service, State Special Transport Service.
- Retraining and advanced training of military doctors (of 28 medical specialties) for the MoD and other Defense Forces.
- Training of scientific and pedagogical staff.
- Problem solving in military medicine and research.
- Improvement of healthcare in the Armed Forces and other military units of Ukraine.
- Education and training of Bogomolets National Medical University students and others medical institutions' reserve officers of medical service.
- Training military medical professionals in order to create a reserve for peacekeeping forces.
- Methodical supervision of training, retraining, and advanced training of reserve officers MS in the Departments of disaster medicine and military medicine in higher institutions of the Ministry of Health of Ukraine.

The System of Military Medical Training

The Master of Medicine (or Master of Pharmacology) tactical level education provides definitive educational level of a specialist who has

- mastered the knowledge and skills of innovation with specialist training;
- experience with applied innovation application and new knowledge generation for completing professional tasks in their specialty; and
- completed the structure of a Master Degree.

This figure illustrates the UMMA's structure of higher military medical education:

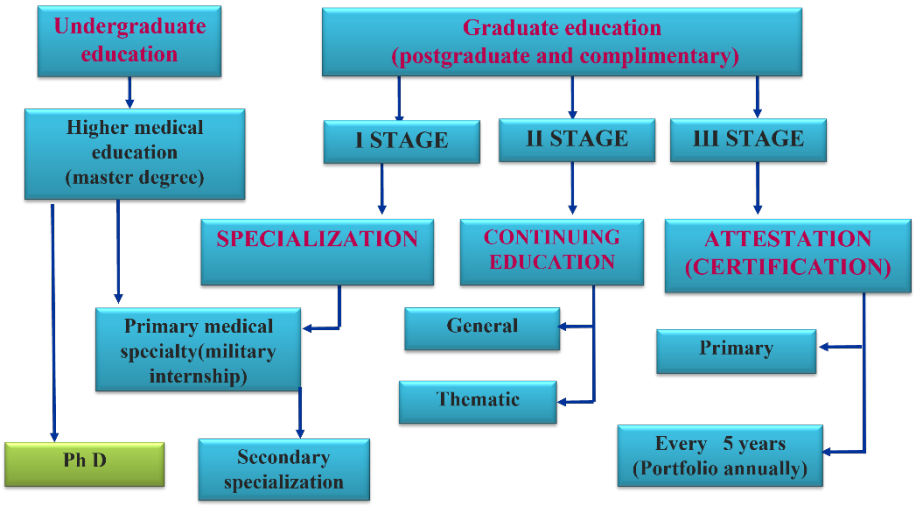

Figure 4

The Master's Degree Thesis is a synthesis of officer independent research and practical work presented in sixty text pages in accordance with state-approved requirements for a research report. The Master's Degree Thesis is accepted during the State Attestation. This higher-level education at UMMA is planned to end in 2024 and be transferred to a civilian medical university.

This figure illustrates the structural model of military medical specialist training:

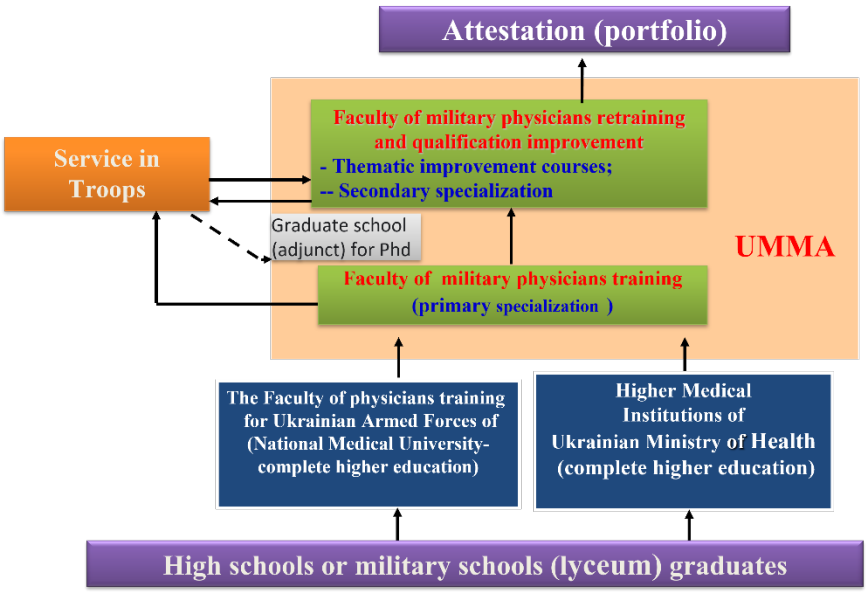

Figure 5

Internship is a compulsory postgraduate education for graduates of the Ukrainian Higher Medical Institutions, intended to improve practical training and professional readiness for independent physician (or pharmaceutical) careers. The cardinal feature of an internship in the Ukrainian Military Medical Academy, compared to a civilian internship, is increased practical training with military components of students under the lead of academic personnel in Clinical Practice at Military Medical Centers.

Professional knowledge of students who studied at the educational and professional master's training program is expanded and consolidated by conducting independent scientific and practical work, researching problems during the practical phase of training, and demonstrating the ability to connect systematic scientific studies with the chosen theoretical direction of research, experimentation and clinical work.

This figure illustrates UMMA medical officer training:

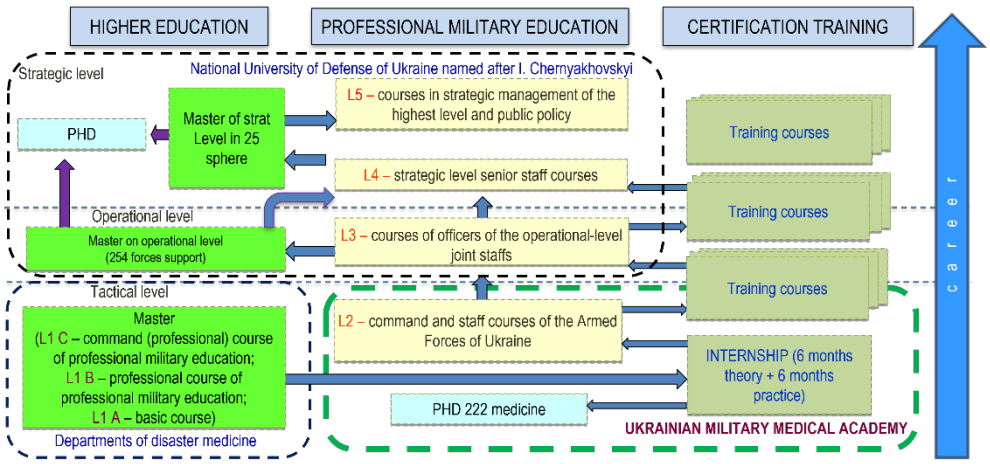

Figure 6

UMMA Group of Organization & support of Distributed Learning (DLO)

The UMMA Distributed Learning group (DLO) implements its functions through the website *mcdl.com.ua* (before the war, *mcdl.mil.gov.ua*).

DLO Group Mission

The mission of the DLO group is centered in the following activities:

- Creation of conditions for personal development and creative self-realization of students.
- Creation of equal opportunities in obtaining quality education.
- The availability of education and the educational process regardless of the student's location.
- Formation of universal and national values.
- Development and implementation of innovative training technologies of distributed learning.
- Integrity and continuity in education.
- Constant improvement of the training content, orientation to the latest technologies and training methods, maximum use of modern information and analytical systems in the training process.
- Integration of educational and scientific approaches for the development of the Academy's activities.
- Plan to develop and implement innovative training technologies for distributed learning.

Resources

The distributed learning platform allows the UMMA's 13 departments to download necessary lecture and video materials, conduct classes for all enrolled students, and create new classes in real-time. Requirements for the distributed learning platform far exceed current human and material resources. The administrative staff comprises only two officers.

Language translation of learning content and courseware into Ukrainian is required, but the AFU's translation resources are currently dedicated to the operation of delivered weapons systems. These resources are limited and disjointed for translation of training and educational content. Only 12% of the personnel of the Academy's divisions, who carry out scientific and scientific-pedagogical activities, speak a foreign language.

Disciplines

Nearly 250 educational disciplines are taught using distributed & blended in-person/on-line education for doctors, pharmacists, and junior specialists with medical or pharmaceutical education. Courses include:

- Current issues of surgery
- Current issues of traumatology and orthopedics
- Organization of dental care for military personnel in a special period
- Current issues of anesthesiology and intensive care (for anesthesiologists)
- Current issues of wartime therapy
- Current issues in the work of a general practitioner
- Surgery (for nurses of medical operating rooms)
- Anesthesiology (for nurse anesthetists) and others

Technology development

Despite the short life of ChatGPT, it is used by some teachers and students in the academy. Even though educational materials based on artificial intelligence have many advantages, they cannot completely

replace medical teachers, so there are some disadvantages, such as a possible decrease in cognitive abilities of both teachers and learners. Our courses are clearly defined, and only sometimes require the creation of a personalized course for education seekers and educational material, there is no need during the training of doctors to perform complex mathematical calculations online. Too much dependence on technology can also have negative consequences, there have been cases of blackouts in this winter. Therefore, it is important to use artificial intelligence as a supplement to the teaching materials developed by the teacher and not to impose excessive use of it.

Administration

According to the regulations, the Distance Learning (DLO) group reports directly to the head of the educational department. Medical workers undergo attestation in accordance with the requirements of the orders of the Ministry of Health of Ukraine (the List of cycles of specialization and thematic improvement in medical and pharmaceutical specialties) 25.11.2022 № 2136. The average term of this is from one to two weeks.

Situation

Russia's war against Ukraine, active hostilities, and the need to perform additional duties significantly complicate the process of professional development. Training is not only preparation for combat conditions, but also important for ensuring sustained combat operations and needs to be completed remotely.

The number of personnel undergoing distributed learning per year is approximately 1700-2000 people. Given the specifics of distributed learning, trainees can be at a permanent place of service (in hospitals or military units). The users are divided according to the level of education and specialization into groups of 5 to 80 people, which is sufficient for the normal functioning of the distributed learning platform.

UMMA also uses the capabilities of the Scientific Distributed Learning Center at NDUU while teaching MILMED personnel at the operational level. UMMA received significant financial assistance from the US government in 2021 for the purpose of simulation training using medical mannequins.

International Cooperation of UMMA

Pedagogical personnel and students of the Academy participate in domestic and international scientific cooperation:

- At scientific and practical conferences, seminars, symposiums, and fora
- As participants in delegations, and working groups
- At field trainings of Medical Corps of Armed Forces of foreign states
- Through the mutual exchange by professors for conducting courses or lectures

UMMA cooperates with educational and research establishments of foreign countries, works within the framework of the Partnership for Peace (PfP) program, and the Partnership for Peace Consortium. UMMA has participated in numerous multilateral and bilateral conferences, training, and medical workshops, in and outside Ukraine, as illustrated in this figure:

From September 7 to 8, 2022, the staff of the Department of Military Surgery and 21 students of the Faculty of Training of Military Doctors participated in the international training on polytrauma surgery, which was conducted by the Med Global USA organization (September 7-8, 2022, Kyiv).

Joint work in the operating room with fellow orthopedic traumatologists from the USA (San Francisco, USA, October 3-11, 2022.

"NATO cold weather warfighting capability for the future", Terningen Arena in Elverum, Norway from 2 to 4 November 2021, NATO COE CWO)
"Development of the Medical Support System of the Armed Forces of Ukraine based on Lessons Learned from armed conflict: cold weather related challenges"

During the large-scale aggression of the Russian Federation in 2022, the head of the department of military surgery, doctor of medical sciences, professor, colonel Korol Serhiy gave a speech at the international conference "Fleetweek-MedEx" (October 3-11, 2022, San Francisco, USA).

Cooperation with Orthopaedic Trauma Institute UCSF, San Francisco General Hospital, 2022.

Figure 7

Main Requirements

The most essential requirements to the system of training and attestation of military medical personnel:

1. Correspondence to state standards of medical education.
2. Correspondence to requirements of customer Medical Corps of the Ukrainian Armed Forces.
3. Achieving NATO standards.
4. Train-the-trainer courses for ADL.
5. The receipt of formal qualifications from NATO/Partner institutions and formal recognition of Ukrainian and European military education facilities.
6. Developing automated processes for use when staff is limited.
7. Interoperability, translation, and quality-assurance of learning content needs development.
8. Capture and incorporate both national and partnership lessons.
9. Economic efficiency.

During the PfPC Advanced Distributed Learning Working Group meeting in Budapest 6-7 of September 2023, these requirements were developed into the following action items:

1. Modernize medical education.
   - *Assist the National Defence Military University to co-develop a specific ecosystem for medical distributed and blended education (MoD order of cooperation exists).*
   - *Assist in developing Microlearning content.*
   - *Purchase a translation AI tool.*
2. Achieving NATO standards. (Through ACT in coordination with MILMED COE)
   - *References: ETEE[2] policy MC 458/4 and education and training Bi-SC directives*
   - *Assist Course development: course review, translation, CCDs[3], alignment requirement.*
   - *Assist evaluation process.*
   - *Assist course certification.*
   - *Assist in Quality Assurance.*
   - *Assist MEDEVAL units, evaluators.*

[2] ETEE – Education, Training, Exercises and Evaluation
[3] CCD – Common Core of Data

3. Train-the-Trainer courses for ADL.
   - *Provide places for UMMA personnel in NATO eLearning instructional design course NSO.*
   - *Cooperate with the NDUU for the train-the-trainer course.*
4. When staff is limited, there's a need for automation to substitute the workforce.
   - *Assist in developing AI for medical decision-making support.*
5. Capture and incorporate both national and partnership lessons.

To achieve this outline, some preliminary agreements were reached during the PfPC ADL Working Group meeting (pending NATO MILMED COE leadership confirmation and approval on all statements pertaining to the NATO MILMED COE, listed above on pages 5-6, and below on pages 19-20):

1. Recommend NATO MILMED COE contribute one of the eLearning courses using their AI translation resources into Ukrainian language for use on the National University of Defence of Ukraine ADL platform (specific area for medical education). This training will be utilized by Ukrainian military medical personnel. In addition, the BLS program for all military staff will be used in accordance with the NATO DEPP requests.

2. For achieving NATO standards of some Ukrainian thematic improvement of courses. The NATO MILMED COE is open to examining the possibilities of cooperation as it relates to ETEE policy and Bi-SC directives to assist with training requirement alignment, course development: course review, course control document preparation, and language translation.

Conclusions

The UMMA performs the tasks of resourcing Ukrainian Armed Forces by highly experienced military medical specialists.

The System of Professional Development, founded in Ukrainian Military Medical Academy, ensures the timeliness and periodicity of advanced medical training, which is based on the State Law in Public Health.

The UMMA requires further cooperation with NATO military medical schools on education and research.

ANNEX D: ACKNOWLEDGEMENTS

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