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DVI IN ARMED CONFLICTS: FEATURES OF IDENTIFICATION IN WARTIME AND COMPLIANCE OF THIS PROCESS IN UKRAINE WITH INTERPOL PROTOCOLS

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Abstract. The full-scale armed conflict in Ukraine has resulted in thousands of fatalities and a rapidly growing number of missing persons, creating unprecedented challenges for forensic identification. While the standard INTERPOL Disaster Victim Identification (DVI) framework was designed for closed disasters with predetermined victim lists, contemporary warfare presents an open disaster model characterized by dynamic missing persons registers, fragmented remains, and continuous security threats.

The aim of the study. The aim of this article is to describe the key differences between classical DVI operations and wartime identification efforts, to present a graduated standard approach for adapting INTERPOL protocols to combat zone conditions, to outline the modified operational sequence of the five INTERPOL DVI phases in the Ukrainian context, to discuss the continued validity of primary identifiers and the supplementary role of secondary identifiers under conditions of fragmentation and decomposition, and to identify the main challenges facing DVI teams in Ukraine, including security risks and data protection.

Results. This article examines the adaptation of INTERPOL DVI protocols to the Ukrainian wartime context, introducing a graduated three-tier standard (Gold, Silver, Bronze) that permits modifications to the identification process based on operational and security constraints. Special attention is paid to the parallel execution of post-mortem and ante-mortem data collection, the continued centrality of the Identification Board, the hierarchy of primary and secondary identifiers under combat conditions, and the practical challenges of risk assessment at the scene.

Conclutions. Despite necessary deviations from peacetime forensic standards, adherence to core INTERPOL principles – particularly the reconciliation phase and the requirement of 100% concordance for at least one primary identifier – remains essential for legally valid and scientifically sound identification in wartime.

Key words: Disaster Victim Identification, forensic medicine, armed conflict, Ukraine, INTERPOL, primary identifiers, humanitarian forensics.

DVI У ВІЙСЬКОВИХ КОНФЛІКТАХ: ОСОБЛИВОСТІ ПРОВЕДЕННЯ ІДЕНТИФІКАЦІЇ У ВОЄННИЙ ЧАС ТА ВІДПОВІДНІСТЬ ПРОЦЕСІВ ІДЕНТИФІКАЦІЇ В УКРАЇНІ ПРОТОКОЛАМ ІНТЕРПОЛУ

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Резюме. Повномасштабний збройний конфлікт в Україні спричинив тисячі смертей та стрімке зростання кількості зниклих безвісти, що створило безпрецедентні виклики для судово-медичної ідентифікації. У той час як стандартна структура Інтерполу для ідентифікації жертв катастроф (DVI) була розроблена для закритих катастроф із наперед визначеними списками жертв, сучасна війна являє собою модель відкритої катастрофи, що характеризується динамічними реєстрами зниклих безвісти, фрагментованими останками та постійними загрозами безпеці.

Мета дослідження. Метою цієї статті є опис ключових відмінностей між класичними операціями DVI та ідентифікаційними заходами у воєнний час, представлення градаційного стандартного підходу для адаптації протоколів Інтерполу до умов зони бойових дій, окреслення модифікованої операційної послідовності п'яти фаз DVI Інтерполу в українському контексті, обговорення подальшої валідності первинних ідентифікаторів та допоміжної ролі вторинних ідентифікаторів в умовах фрагментації та розкладання, а також визначення основних викликів, з якими стикаються команди DVI в Україні, включаючи ризики безпеки та захист даних.

Результати дослідження. У цій статті розглядається адаптація протоколів DVI Інтерполу до українського воєнного контексту та впроваджується градаційний трирівневий стандарт (Gold, Silver, Bronze), який дозволяє модифікувати процес ідентифікації з огляду на операційні обмеження та

обмеження, пов'язані з безпекою. Особливу увагу приділено паралельному виконанню збору посмертних (post-mortem) та досмертних (ante-mortem) даних, незмінній центральній ролі Ідентифікаційної комісії, ієрархії первинних та вторинних ідентифікаторів в умовах бойових дій, а також практичним викликам оцінки ризиків на місці події.

Висновки. Незважаючи на необхідні відступи від мирних судово-медичних стандартів, дотримання основних принципів Інтерполу, насамперед фази зіставлення (reconciliation) та вимоги 100% збігу щонайменше за одним первинним ідентифікатором, залишається обов'язковою умовою для юридично обґрунтованої та науково достовірної ідентифікації у воєнний час.

Ключові слова: ідентифікація жертв катастроф, судова медицина, збройний конфлікт, Україна, Інтерпол, первинні ідентифікатори, гуманітарна судова експертиза.

Introduction. Since February 2022, the war in Ukraine has generated a humanitarian catastrophe of immense proportions [1]. Thousands of combatants and civilians have lost their lives, while tens of thousands remain officially missing. The task of recovering, documenting, and identifying the deceased falls to a forensic community operating under conditions of active hostilities, mine contamination, limited access to affected areas, and a constantly evolving register of missing persons [1-5]. This scenario differs fundamentally from the classical disaster victim identification paradigm, which typically addresses closed disasters such as aircraft crashes where a passenger manifest exists .

The INTERPOL DVI Guide (2023) explicitly states that the standard DVI procedure is not designed for protracted armed conflicts [2]. Nevertheless, the protocols, methodological frameworks, and accumulated experience of DVI remain critically relevant and have been actively adapted to the Ukrainian context. The present article draws upon the practical experience of establishing a DVI training center at Bukovinian State Medical University in Chernivtsi, in partnership with the European Training Centre for Active Forensic Expertise from Germany, as well as upon the lessons learned from two international masterclasses conducted in 2023 and 2024. The objective is to articulate a coherent framework for wartime DVI operations that respects international standards while acknowledging the harsh realities of the battlefield.

The aim of the study. The aim of this article is to describe the key differences between classical DVI operations and wartime identification efforts, to present a graduated standard approach for adapting INTERPOL protocols to combat zone conditions, to outline the modified operational sequence of the five INTERPOL DVI phases in the Ukrainian context, to discuss the continued validity of primary identifiers and the supplementary role of secondary identifiers under conditions of fragmentation and decomposition, and to identify the main challenges facing DVI teams in Ukraine, including security risks and data protection.

Results and discussion. The adaptation of DVI protocols to the armed conflict in Ukraine requires careful consideration of several interconnected dimensions. When a DVI team operates within a sovereign state under armed conflict, compliance with local legislation remains mandatory, and international forensic experts deployed to Ukraine are expected to demonstrate high levels of objectivity and self-restraint [3]. Moreover, in a combat zone, the DVI team must remember that, in addition to human identification, one of the primary tasks is to establish the cause of death, with the understanding that the human body in this context constitutes legal evidence. This dual function – humanitarian and evidentiary – distinguishes wartime DVI from peacetime disaster response and aligns with the forensic anthropology integration in DVI operations documented since the 2004 Indian Ocean tsunami.

A fundamental distinction must be drawn between closed and open disasters. Classical DVI operations typically involve a closed disaster, such as an aircraft crash, where a predetermined passenger manifest exists, and the identification process proceeds linearly from that list [4]. In contrast, armed conflict represents an open disaster: the scene of the event is diffuse, human remains may be scattered across large territories, and there is often no pre-existing list of victims. Instead, forensic teams work with a dynamically changing register of missing persons, which grows and shrinks as new reports arrive and as identifications are confirmed. This distinction has profound implications for the organization of the identification process, as ante-mortem data collection becomes at least as challenging as post-mortem examination.

Recognizing that combat conditions often preclude the full application of peacetime forensic standards, the Ukrainian DVI initiative has adopted a graduated three-tier framework. The Gold Standard represents the ideal approach, applied when sufficient time, appropriate equipment, and properly trained personnel are available. Under the Gold Standard, every body recovery is methodically documented, the chain of custody is meticulously maintained, and all three primary identifiers are pursued whenever possible. The Silver Standard is invoked when time, resources, or equipment are constrained, justified only when circumstances render the Gold Standard dangerous or impossible to implement – never for reasons of financial economy. The Bronze Standard represents the minimum acceptable level of evidence collection,

applied under extreme conditions requiring rapid entry into and evacuation from a hazardous area – the so-called "grab and go" principle, triggered by violations of ceasefire agreements or critical shortages of equipment . In the current war in Ukraine, DVI teams are frequently compelled to operate at the Silver or Bronze levels due to active combat and minefields, yet any departure from the Gold Standard must be justified exclusively by security factors.

The INTERPOL DVI framework organizes the identification process into five sequential phases: Scene, Post-Mortem data collection, Ante-Mortem data collection, Reconciliation, and Identification Board. In a classical operation, these phases are executed linearly. In wartime Ukraine, this linear progression is often impossible. Phase 1 may be severely truncated or modified due to active hostilities. Phase 2 and Phase 3 frequently proceed in parallel, as the list of missing persons evolves and as remains are recovered piecemeal over extended periods. Phase 4 becomes an iterative rather than terminal process, with multiple rounds of comparison as new data become available. Crucially, Phase 5 – the Identification Board – remains an invariant requirement, ensuring that even identifications based on limited evidence receive a formal, multidisciplinary review before being legally certified.

At the scene, forensic pathologists perform essential functions that extend beyond traditional autopsy roles: detection of human bodies and body parts, differentiation between human and non-human remains, assistance to police and crime scene investigation units with sample collection, ensuring proper labeling with unique file numbers, protection of victims' bodies during transport, and body management particularly in cases of highly fragmented remains. Medical experts – including pathologists, anthropologists, and odontologists – are uniquely qualified to assist when remains are severely fragmented, decomposed, or burnt. As noted in the literature, a multidisciplinary approach is essential to the success of DVI operations, and maintaining this interaction from initial planning through to Reconciliation Panel meetings is critical for avoiding errors [3,5].

Triage in DVI refers to the prioritization of work with human remains and the allocation of limited resources to maximize efficiency and accuracy. At the scene, triage involves an initial assessment of hazards, categorization of remains as complete versus fragmented, and evaluation of the potential for primary identification methods. Each set of remains is assigned a unique INTERPOL number at this stage. Continuous risk assessment is more critical in combat zones than in any other DVI deployment, as active fighting, booby traps, explosives, chemical and biological threats, infectious agents, and nuclear hazards must be constantly evaluated. The risk assessment process comprises identifying hazards, assessing the likelihood and severity of harm, implementing mitigation controls, and continuous monitoring by designated safety officers.

The three primary identifiers recognized by INTERPOL are friction ridge analysis, comparative dental analysis, and DNA analysis. Unique serial numbers from medical implants may also serve as reliable primary identifiers. The fundamental rule for reconciliation is that identification is considered valid only upon achieving 100% concordance for at least one of the three primary methods, provided that secondary data do not contradict this conclusion. In the Ukrainian wartime context, dental analysis often has a practical advantage over DNA profiling in cases of extreme burning or fragmentation, as dental comparison can be completed more rapidly. One documented case involved the complete destruction of a body by explosion, where identification became possible only through recovery of a proximal phalanx of the great toe from a preserved foot, followed by DNA extraction and comparison with family reference samples. This aligns with the principle that multiple parallel lines of evidence should be used for identification, as required by the Minnesota Protocol (2017), Bournemouth Protocol (2020), and DVI-INTERPOL standards.

DNA analysis, while powerful, is contingent on the availability of reference samples. In cases where no close relatives exist or no missing person report was filed, DNA analysis may be impossible. Under such circumstances, fingerprint comparison offers a viable alternative, leveraging Ukraine's extensive automated fingerprint database. The combined use of multiple primary identifiers strengthens statistical confidence in identification and reduces the likelihood of error. Secondary identifiers – personal descriptions, medical findings (scars, tattoos, piercings, birthmarks), clothing, and property – typically serve to support primary identification . The collection of ante-mortem secondary data must be approached with caution, as information from family members may be subjective, and data should be verified from official sources such as hospitals, military records, and social media platforms when possible.

Several contentious issues remain unresolved and require further discussion within the international forensic community. First, if a body is severely burnt, lacking identifiable fingerprints and with DNA degraded beyond analysis, but is found with documents and unique clothing that reliably identify the individual – does this constitute official identification under INTERPOL wartime protocols? Second, ante-mortem data collected from families often contain sensitive military information; protecting such data from

enemy intelligence while ensuring accessibility for forensic teams is a novel challenge specific to armed conflicts. Third, standard DVI protocols assume a secure scene, but combat zones violate that assumption fundamentally, requiring modification of initial safety assessments when booby traps may be placed under or near bodies. Despite these challenges, technological innovations including mobile forensic workspace applications and artificial intelligence-based preliminary matching systems – such as the ID Victim system which uses deep metric learning to compare post-mortem photographs with ante-mortem images – are being deployed to enhance DVI operations.

Conclusions.

The adaptation of INTERPOL DVI protocols to the armed conflict in Ukraine represents a significant evolution in humanitarian forensic medicine. The open disaster model of armed conflict requires modifications to the classical linear DVI workflow, with post-mortem and ante-mortem data collection proceeding in parallel. The graduated three-tier standard (Gold, Silver, Bronze) provides a pragmatic framework for adjusting forensic procedures to combat conditions, where departures from the Gold Standard are permissible only when justified by security factors. While the sequence of the five INTERPOL phases may be modified in practice, the Identification Board remains non-negotiable for every positive identification. The "three keys" rule – 100% concordance for at least one primary identifier – remains the gold standard for legal identification, with dental analysis and fingerprinting serving as essential methods when DNA reference samples are unavailable. The Ukrainian experience demonstrates that even under the most challenging conditions, it is possible to conduct DVI operations that respect international standards, preserve the dignity of the deceased, and restore the right of the dead to an identity.

Author's Declaration

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