



Battlefield lessons shared from the war in Ukraine (DCR)

THOR

REMOTE DAMAGE CONTROL RESUSCITATION
SYMPOSIUM

Bergen, Norway, 19 June 2023

JOHN QUINN

Disclaimer and Disclosures

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Affiliations, locations, media, operational security

- Emergency Medicine Doctor, paramedic and PhD
- Humanitarian NGOs
 - Medsanbat, MOAS, CUF, HEAL Corp. etc
- Academics, Institutions
- Prague Center for Global Health
- East Surrey Hospital
- OSCE Special Monitoring Mission for Ukraine (SMM)
- NATO Military Medical Center of Excellence (“MilMed CoE”)
- George C. Marshal European Center for Security Studies

LL/LS 2022-2023

- **Scene safety / conventional threat**
- **Tourniquets + access to Blood at Pol/PoW**
- **Pain management**
- **Antibiotics: biogram, standards**
- **C2: triage, CCPs/stabpoints, mass casualty and interoperability (micro/macro), CBRNE**
- **Neurotrauma: TBI, mental health, MACE2**
- **Epidemiology: patient demographics**
- **Patient assessment: missed injuries**
- **Clinical governance: DCR**

Prehospital lessons from the War in Ukraine: *Damage control Resuscitation and Surgery Experiences from Point of Injury to Role 2*

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FIRST FACULTY
OF MEDICINE
Charles University

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Morbidity and Mortality Data to date

- 12 to 14 million people displaced
- 20-70,000+ civilians dead
- 45 to 100,000 Ukrainian soldiers dead
- 150-200,000+ Russian soldiers and mercenaries likely dead
- Healthcare infrastructure decimated
- Anecdotally, 20 to 40% of Ukrainian warfighters die from preventable injuries / complications



Historical Background to DCR/access to blood in UKR

- 2014 – 2017: unsustainable
 - Trained TCCC and Blood need
- 2018-2019: morbidity/mortality
 - Social media
- 2020-2021: OSCE
 - *Rejected*
- Training ongoing

OSCE Point of Injury Guidelines (“OSCE POIG”) for Medical Personnel Winter 2020-2021

Adapted for use from the Tactical Combat Casualty Care (TCCC) Guidelines from November 2020¹

RED text indicates new text in this year’s update to the TCCC Guidelines²; **BLUE text** indicates text that did not change but was relocated within the guidelines. Recent changes include Tranexamic Acid (TXA) administration, prevention of trauma induced hypothermia, fluid resuscitation, analgesia, abdominal evisceration, and separation of the EVAC guidelines.

Basic Management Plan for Care Under Fire/Threat

1. Take cover, tell others to do so and sound the alarm.
2. Direct or expect casualty to take cover.
3. Direct casualty to move to cover and apply self-aid if able **or when tactically feasible, move or drag casualty to cover**.
4. Try to keep the casualty from sustaining additional wounds.
5. Casualties should be **extracted** from burning vehicles or buildings and moved to places of relative safety. Do what is necessary to stop the burning process.
6. Stop life-threatening external hemorrhage if tactically feasible:
 - a. Direct casualty to control hemorrhage by self-aid if able.
 - b. Use a CoTCCC³ recommended limb tourniquet for hemorrhage that is anatomically amenable to tourniquet use.
 - c. Apply the limb tourniquet over the uniform clearly proximal to the bleeding site(s). If the site of the life-threatening bleeding is not readily apparent, place the tourniquet “high and tight” (as proximal as possible) on the injured limb and move the casualty to cover.
7. Airway management is generally best deferred until the Field Care phase.

Basic Management Plan for Field Care

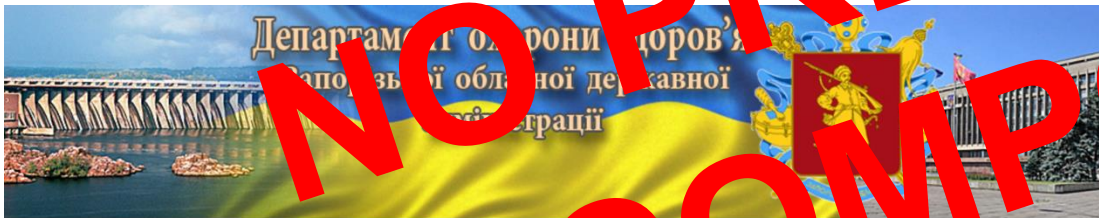
¹ These guidelines are updated regularly through the scientific support of the Committee for Tactical Combat Casualty Care (CoTCCC) and must be updated every year accordingly in keeping with best practices from the National Association of Emergency Medical Technicians (NAEMT) standards. As these international clinical standards are updated, this annex and the point of injury care guidelines for all OSCE medical staff must also be updated accordingly. These adaptations have not been peer reviewed by the NAEMT and are not currently approved by OSCE for use.

² For the purpose of process, the TCCC abbreviation representing tactical combat casualty care will be replaced with “POIG” to represent point of injury guidelines, this is to fulfill procedural and administrative requirements at OSCE. TCCC standards are followed.

³ Please see comments above as it relates to the committee for tactical combat casualty care (CoTCCC), updated regularly and available at: <https://its.amedd.army.mil/index.cfm/committees/cotccc>.

March 2022

- Order of the Ministry of Health of Ukraine dated 05.03.2022 No. 418 "On the approval of Methodological recommendations for the application of the protocol of massive transfusion of blood components to victims at the stages of evacuation" (March 5, 2022)



Пошук на сайті >Search

Department

Main

Regulations on the department

Structure

Healthcare institutions

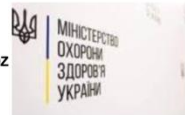
The composition of the expert groups of the DOZ

Rehabilitation institutions

Activity

Order of the Ministry of Health of Ukraine dated 05.03.2022 No. 418 "On the approval of Methodological recommendations for the application of the protocol of massive transfusion of blood components to victims at the stages of evacuation"

Published: Monday, March 07, 2022, 2:33 p.m Views: 2626



In accordance with the Law of Ukraine of February 24, 2022 No. 2102-IX "On Approval of the Decree of the President of Ukraine "On the Introduction of Martial Law in Ukraine", Clause 8 of the Regulation on the Ministry of Health of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine of March 25, 2015 No. 267 (as amended by Resolution No. 90 of the Cabinet of Ministers of

Ukraine dated January 24, 2020) and in order to improve the quality of providing medical care to victims during the evacuation stages,

1. Approve the attached Methodological recommendations for the application of the protocol of massive transfusion of blood components to victims at the stages of evacuation.
2. The heads of health care institutions should ensure the placement of blood component stocks in emergency (urgent) medical care departments and/or reception departments.
3. The Minister of Health of the Autonomous Republic of Crimea, regional, Kyiv and Sevastopol city state administrations to ensure the implementation of this order.
4. Control over the implementation of this order will be entrusted to Deputy Minister I. Mykychak.
5. This order enters into force from the day of its official publication.

July 2022

- **July 11, Ukr v: Наказ МОЗ України від 11.07.2022 № 1192 "Про затвердження Стандартів медичної допомоги «Надання медичної допомоги постраждалим з геморагічним шоком на догоспітальному та госпітальному етапах при травмі»"**

1. Declare that the order of the Ministry of Health of Ukraine dated March 5, 2022, No. 418, "On the Approval of Methodological Recommendations for the Application of the Massive Blood Component Transfusion Protocol to Injured Individuals during Evacuation," has become invalid.
2. Instruct the State Enterprise "State Expert Center of the Ministry of Health of Ukraine" (Babenko M.M.) to ensure the inclusion of the Standards of Medical Care "Provision of Medical Care to Patients with Hemorrhagic Shock at the Pre-hospital and Hospital Stages in Case of Trauma" in the Register of Medical and Technological Documents.
3. Deputy Minister of Health of Ukraine - Chief State Sanitary Doctor of Ukraine, Kuzin I.V., is responsible for monitoring the implementation of this order.

Additional legislation July 2023

Chapter VI

PROCEDURE FOR PROCUREMENT, PROCESSING, TESTING, STORAGE, DISTRIBUTION AND SALE OF DONOR BLOOD AND BLOOD COMPONENTS

Article 22. Procurement, processing, testing, storage, distribution and sale of donor blood and blood components

1. Procurement, processing, storage, distribution and sale of donor blood and blood components are carried out by subjects of the blood system of state and communal forms of ownership.

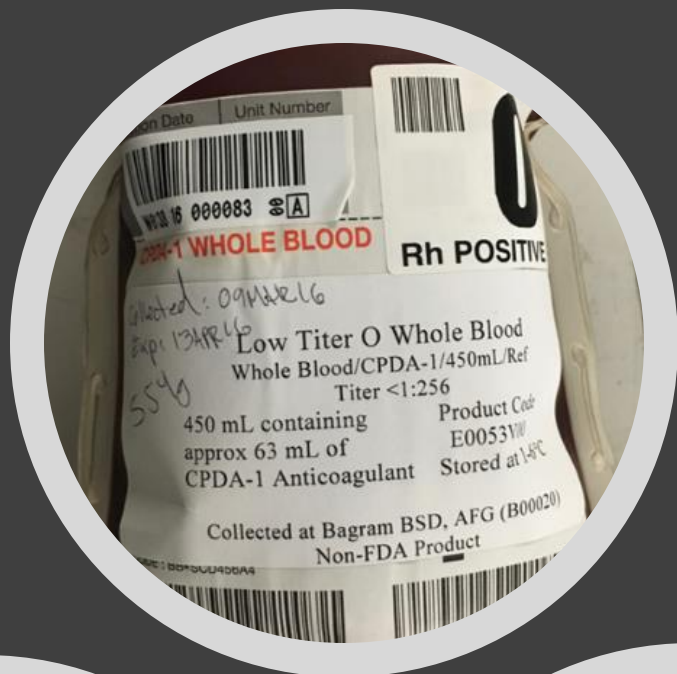
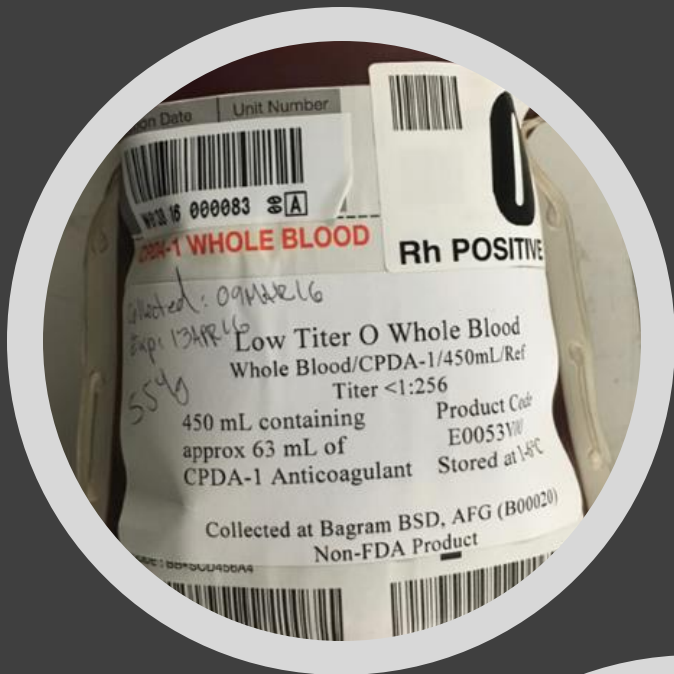
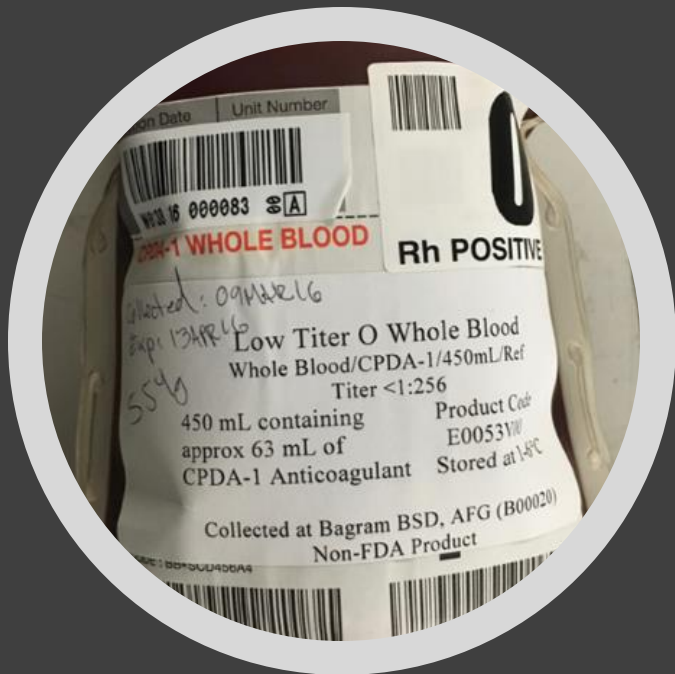
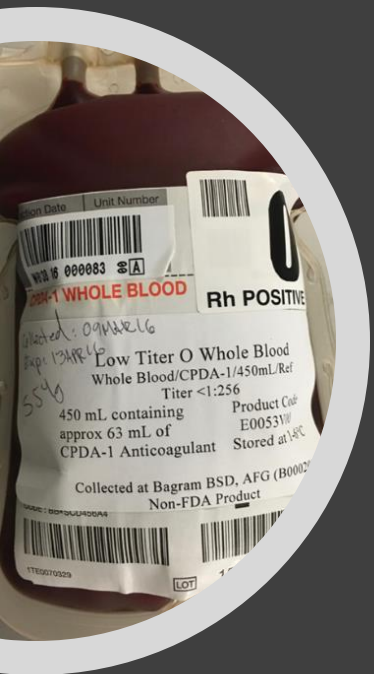
2. Procurement, processing, storage, distribution and sale of donor blood and blood components can also be carried out by private business entities, provided that such entities use the property of the entities of the blood system, defined in part one of this article, on the right use, other property rights, under the terms of a concession or on other legal grounds, including in accordance with concluded contracts, in particular within the framework of public-private partnership.

3. Donor blood and blood components intended for transfusion, procured by the entities specified in the second part of this article, are subject to mandatory sale to entities providing transfusion services of blood and/or blood components, in the order and in the amount, determined by the Cabinet of Ministers of Ukraine.

4. Preparation of plasma for fractionation, provided it is processed and used for the production of blood products, processing and storage of donor blood and blood components, production of blood products can also be carried out by economic entities of any form of ownership.

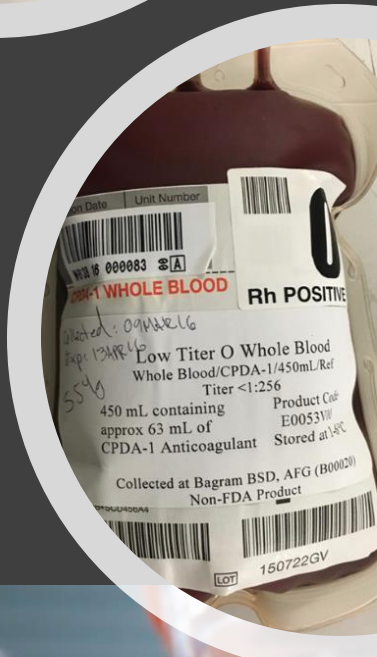
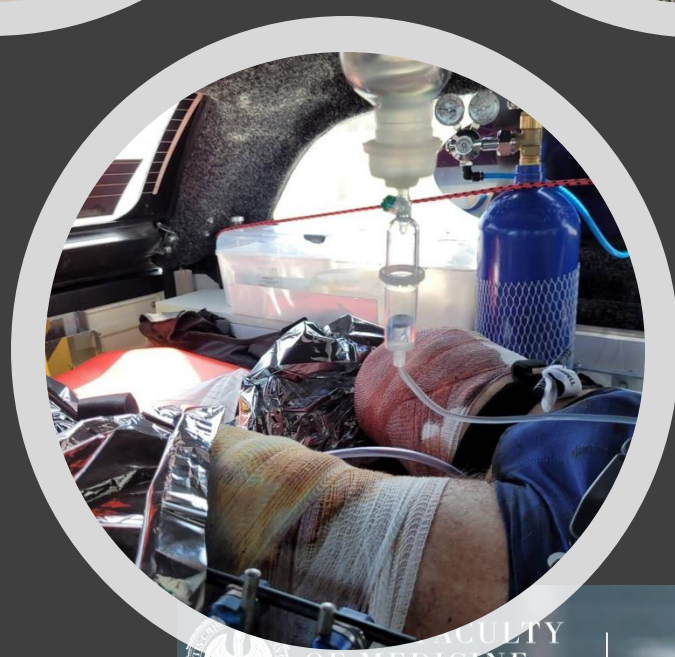
5. In the event that the entities specified in parts one and two of this article, for objective reasons, are unable to fulfill the plan for providing health care facilities with donor blood and blood

- Summer 2022
- Summer 2023
 - Prehospital
- Prehospital blood will be legal (doctors and those trained)
- Clinical governance and standards?



TCCC-Blood-PFC nexus

- TCCC training 2014 to COVID
- TCCC February 24th 2022, to present day
- What happens after TCCC?
- Where does blood start? Who?
- PFC to scale



Стандартизоване навчання TCCC для військових



Collections

Clinical guidelines 2021

Course for Medical Personnel (MP)

Combat Lifeguard Course (CLS)

КУРС ДЛЯ ВСІХ
ВІЙСЬКОВОСЛУЖБОВЦІВ

КУРС БОЙОВОГО
МЕДИКА / САНІТАРА

КЛІНІЧНІ

Trauma Resuscitation Evacuation Combat Course (TRECC)

- Pilot – Heal Corp
- National Academy of the Ministry of Internal Affairs (MoIA)
- 6 weeks
- DCR, DCS, Blood, Blood Blood
- Sustainable practice
- Integrate DCR/DCS into basic training
- MoD/AFU to adapt?



Evacuation up to May 2023



Limited access to appropriate tourniquets, training

Ukraine: TXA IM

Limited access to calcium replacement therapy

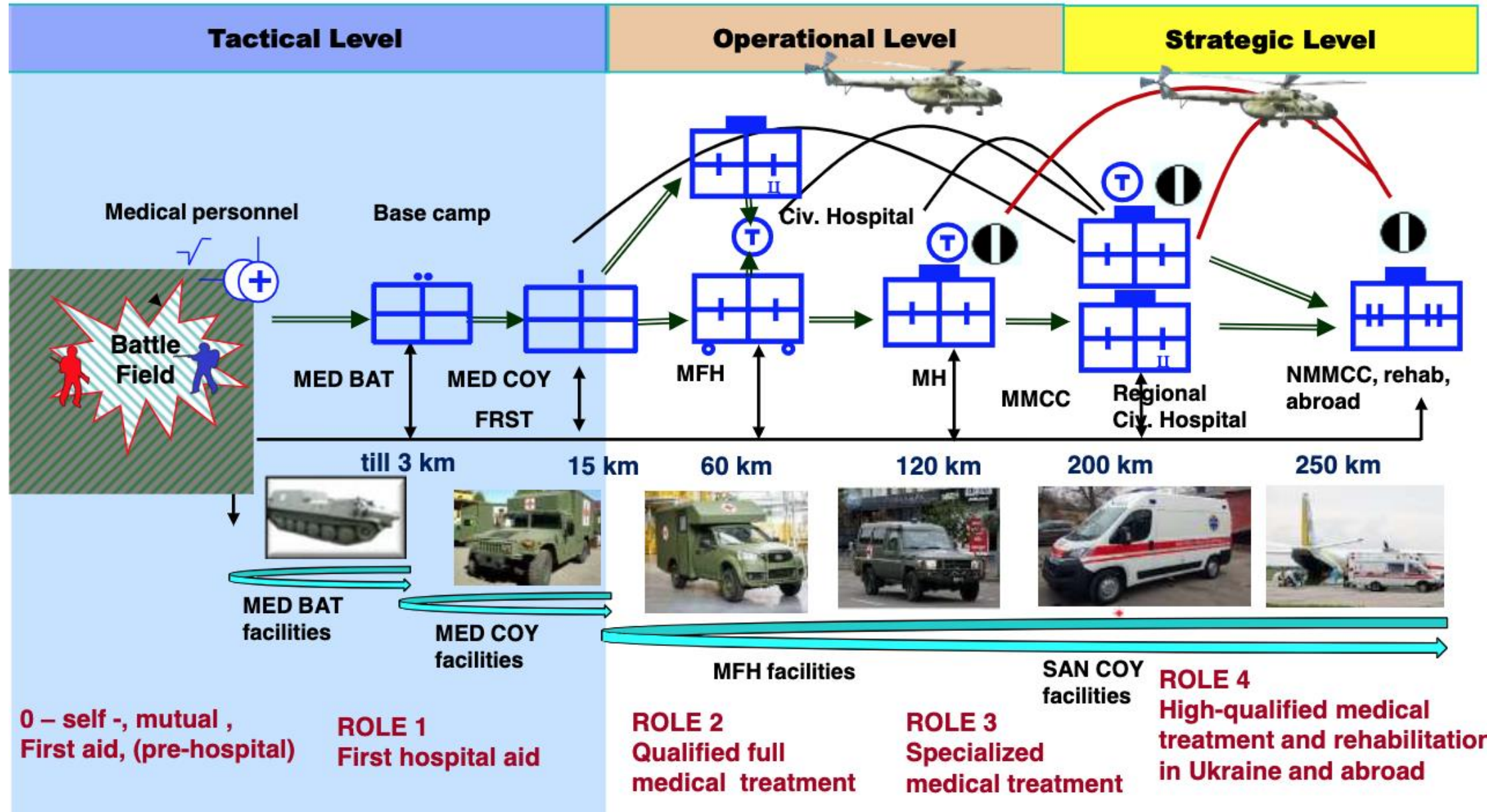
reduced crystalloid use, limited widespread blood access

Focus on hypothermia

No access to TEG, ABG

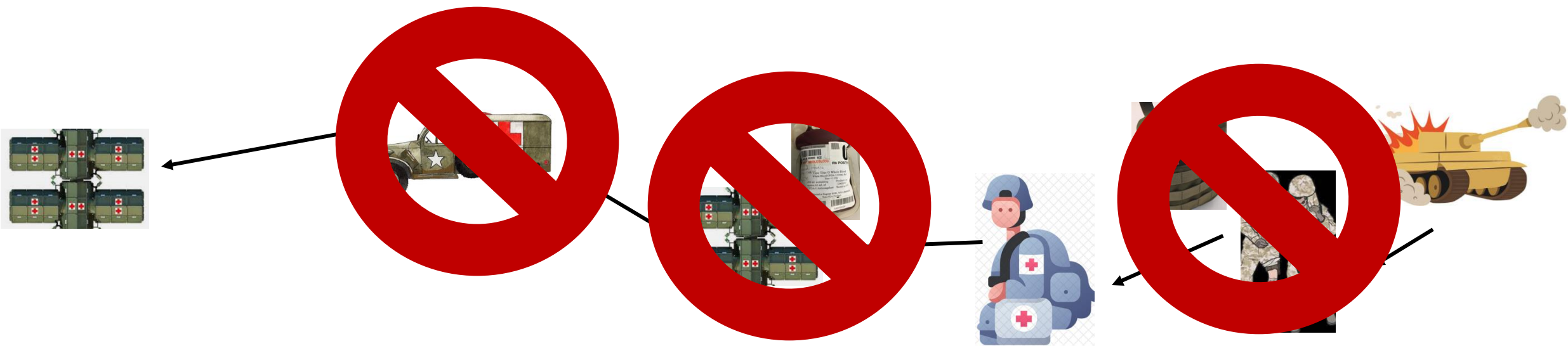
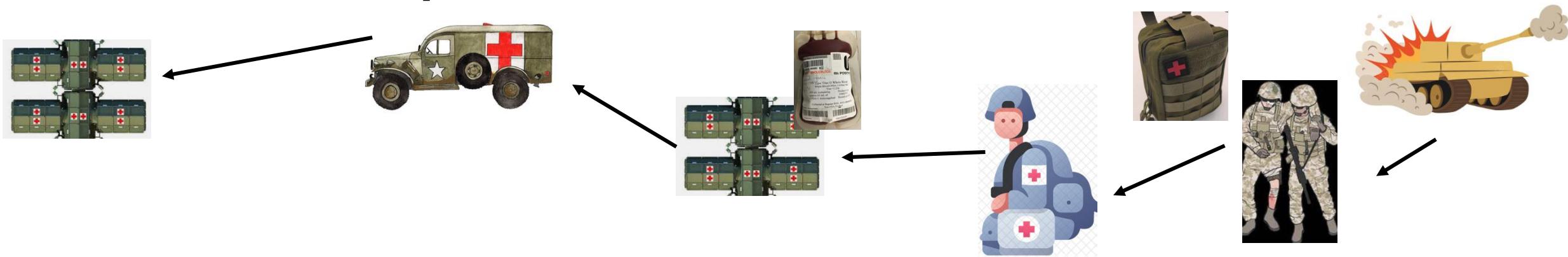
Thromboelastography (TEG) assesses coagulation throughout all phases of clot formation and is the most commonly used viscoelastic assay in the United States.

C2



Content credit: Commander of the Medical Forces, Armed Forces of Ukraine, July 20 22, Brussels Belgium

Anecdotal experience, different fields of fire

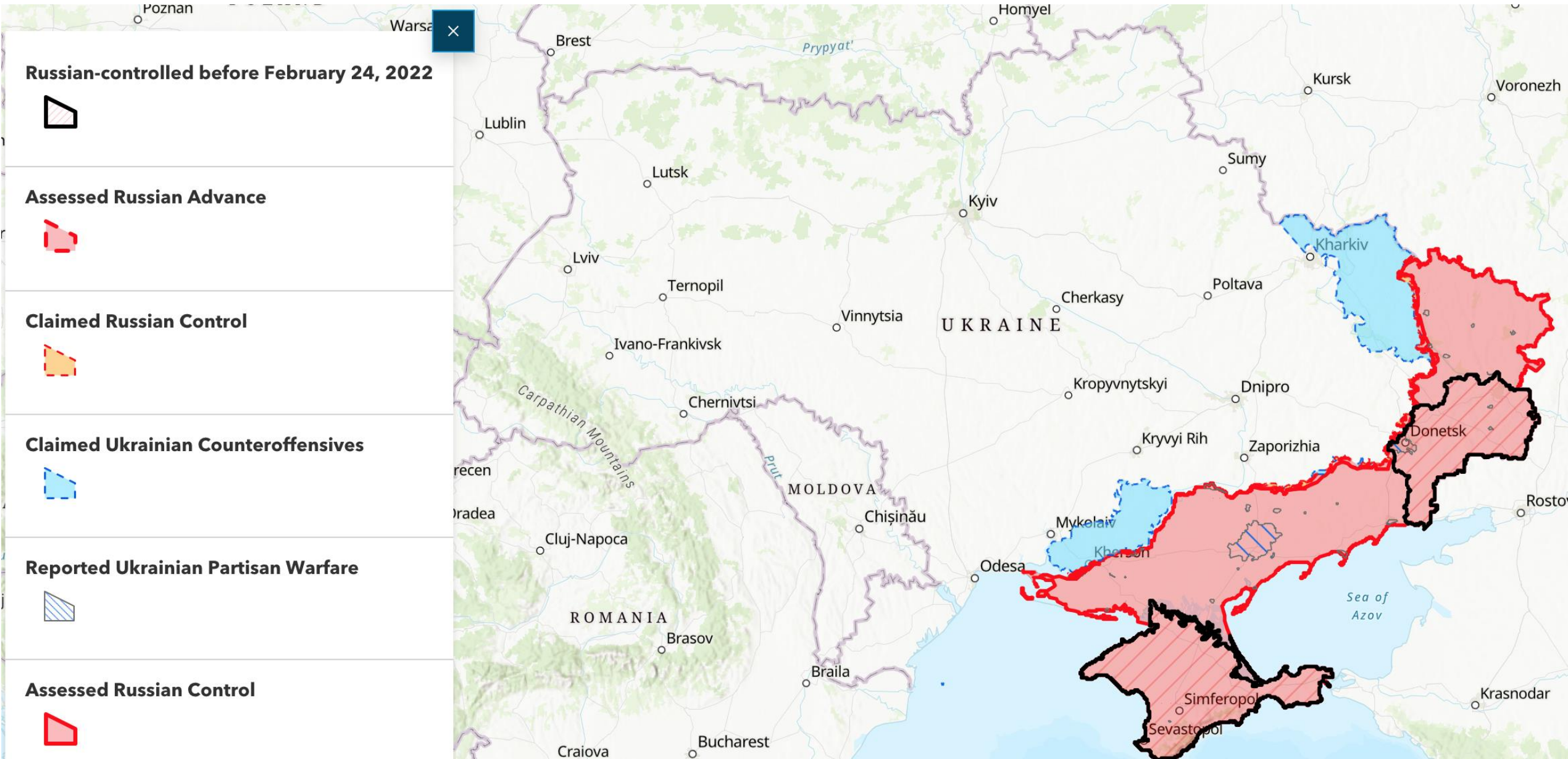


Preventable morbidity ↑ and mortality ↑



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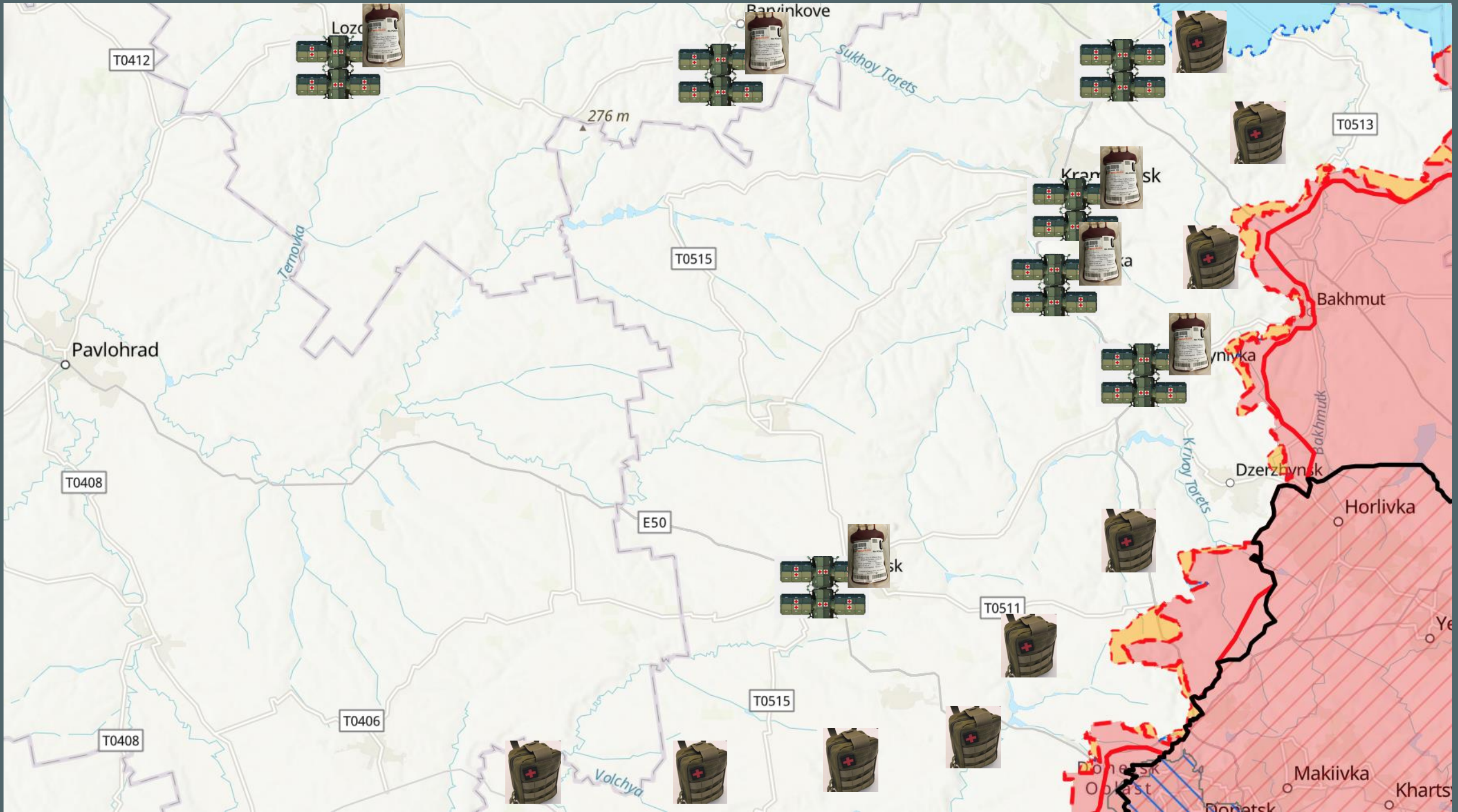
Prague Center for Global Health











Humanitarian and NGO prehospital in Ukraine



- Migrant Offshore Aid Station (MOAS)
- GRM
- GoDocs
- HEAL Corp
- Pirogov Battalion
- Hospitallers
- Doctors Without Borders
- Academy of Emergency Medicine (AEM)
- Road to Relief
- WHO/HC
- Many others



PIROGOV FIRST VOLUNTEER
MOBILE HOSPITAL



MEDECINS SANS FRONTIERES
DOCTORS WITHOUT BORDERS





Current issues:

- **AFU: prehospital blood transfusion protocol?**
 - AFU = hospital level
 - combat medics and medics in stabilization points are Ground Forces of AFU
 - different structures of AFU)
- **Supply of O Neg for Pol/PoW support? Cold chain, requests, support, training needed? LTOWB?**
- **Walking blood bank: academic?**
- **Autotransfusion used widely.**



Medical Players

- **Тетяна Миколаївна Остащенко:**
 - Major General, Commander of the Medical Forces of the Ukrainian Armed Forces since 2021
- **Костянтин Віталійович Гуменюк:**
 - Chief Surgeon of the Armed Forces of Ukraine, Command of the Medical Forces of the Armed Forces of Ukraine, Colonel of the medical service





Medical Players

- Віктор Кирилович Ляшко
- Epidemiologist – Vogo Uni

- IHOR KUZIN
- Deputy Minister of Health - Chief State Sanitary doctor of Ukraine
- Epidemiologist, master of public health, master of public administration, specializing in “Healthcare Organization and Management”, “Epidemiology”



Acute Prehospital Gaps:

- The best medical commanders and practitioners have been killed, rotated or promoted – several rotations deep at present
- Medical C2:
 - the evacuation chain, clinical standards, GHE and medical logistics
- Clinical Governance for DCR/Blood
- Surveillance and early warning CBRNE
- Access to blood at point of injury / point of wounding – LTOWB (WG)
- Adequate access to pain management (logs/training)
- Access to CT for trauma / radiology for reporting
- Data management and trauma registration
- Training on TCCC/DCR/DCS
- Interoperability across services



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Welcome at NATO MILMED COE

Lesson Learned
(N_x): lessons
shared

- Lessons learned quickly become lessons lost unless they are constantly lessons shared
- Lessons learned sharing platforms:
<https://www.coemed.org/>
- Center for Global Health Engagement (DoD):
<https://cghe.usuhs.edu/home>
- Other NATO partners

The Enemy

- Are preparing
- Are adapting
- Are listening
- Are training
- Are not stopping
- Are multi-domain
- Peer adversary



Summary

- Legal provision to provide blood prehospital
- LTOWB WG: need preparation and acceptance now
- Training
- Cold chain management support
- Blood at PoI/PoW to reduce morbidity and mortality



END



Lesson Shared (1): safety and incoming

- Scene safety
- Healthy respect for the enemy
- PPE
- Contingency
- Comms
- Mental health
- Are you a shooter or a medic?
- Basic PPE may not be enough



Lesson Shared (2): tourniquets

- Training
- Timing
- Conversion
- Quality
- Preventative (*en route casualty care*)
- DCR/DCS – LTOWB, FWB and blood product











- Land mine: partial foot amputation, fragmentation small entrance no exit, pelvic involvement. Access to TXA, tourniquet, DCR/DCS 4 hours from injury.



Lesson Shared (3): pain management

- Have it, know it, use it, be safe
- Opiate agonist-antagonist
- Gamma-hydroxybuterate
- Ketamine
- Fentanyl: training and access
- Induction: Sedative-hypnotics, adjuvants and Paralytics
- Antiemetics?
- En route casualty care





Lesson Shared (4): antibiotics

- Biogram
- Death in 18 hours
- IFAK
- Allergies, types
- Prolonged field care:
continuum of care
- Dirty wounds





Lesson Shared (5): triage, CCPs, mass casualty and interoperability

- MASCAL triage
- Logistics: location, supplies, level of care, evacuation chain
- Inadequate transport vehicles
- Serial requirement to triage kit/blood
- Unknowns and moral injury
- Mental health resiliency
- Stabilization Points vs CCPs
- Patient packaging: basics, good, better and best
- Patient data transfer (SIGNAL+TCCC cards)

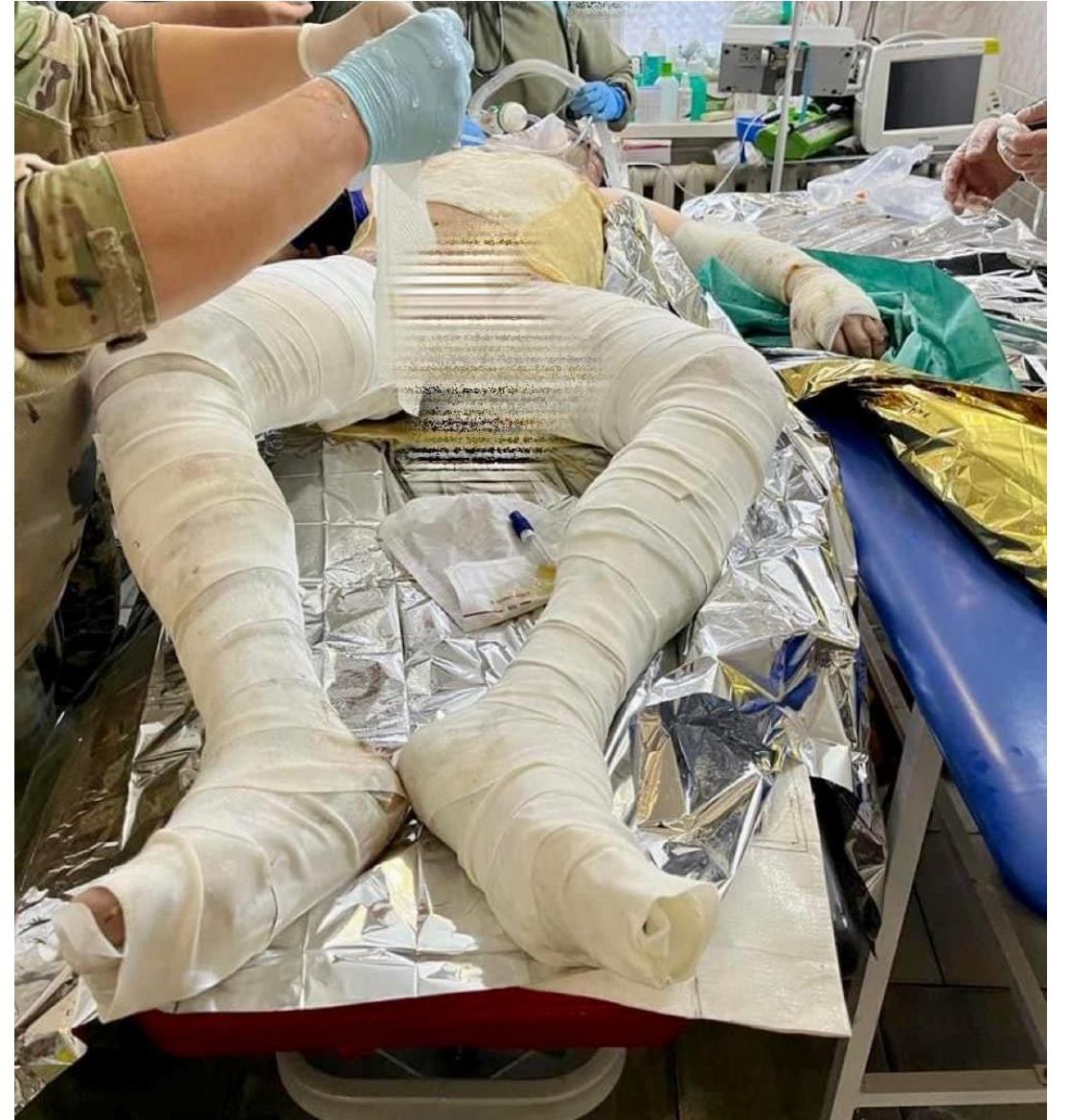
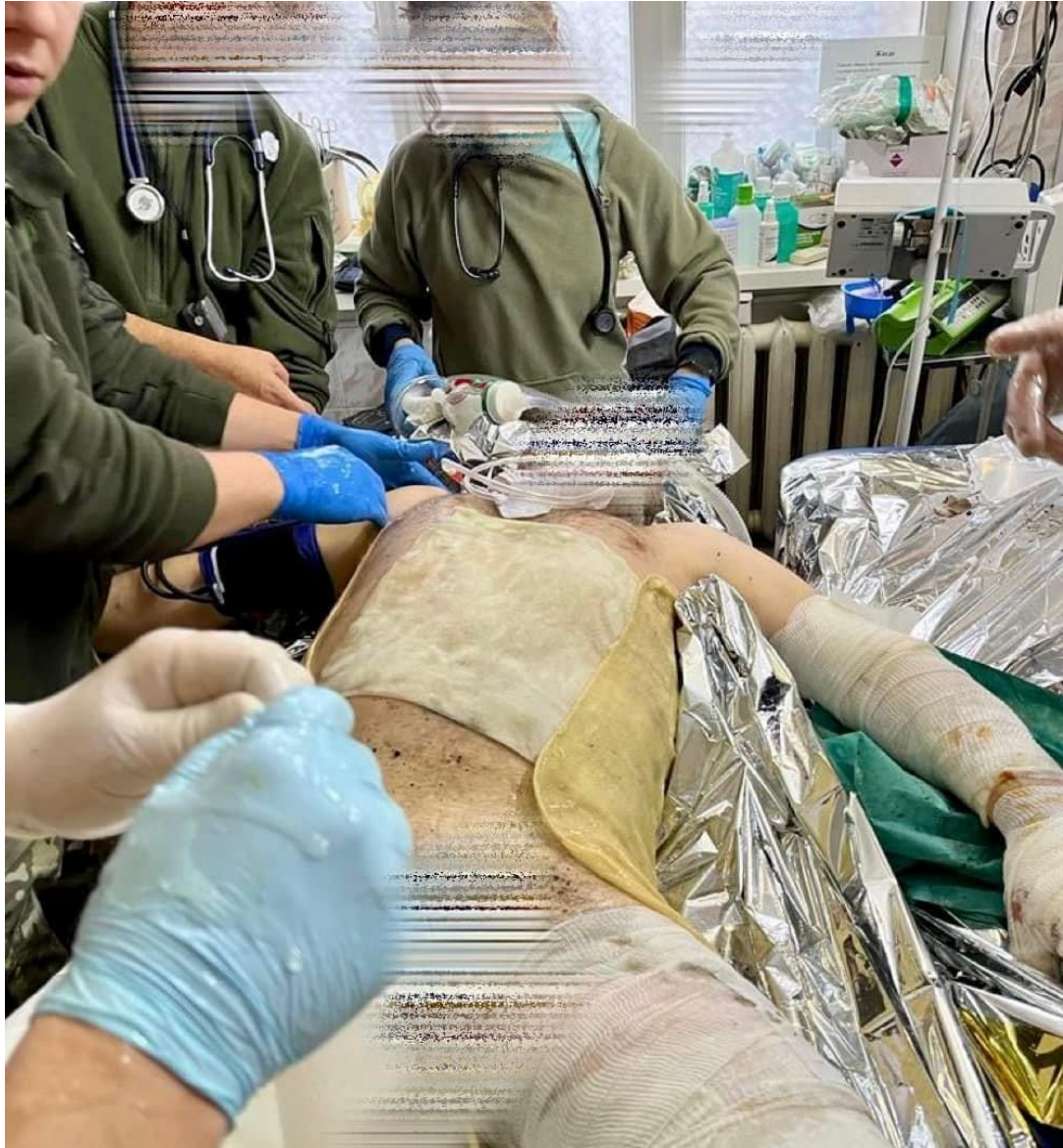




Interoperability

- Micro/Macro
- JTS+NATO + patient data
- CBRNE threat
- Evacuation chain from POI to Role 4 / outside UKR







Lesson Shared (6): Traumatic Brain Injury (TBI)

- Managing TBI in this conventional war context + prolonged field care.
- Mental health and TBI
- Most of our IRQ/AFG experience is TBI with closed/confined blast and associated significant injuries
- Isolated TBI (thermobarics)
- ICP progression from walking wounded to not
- Hemostatic disruption (bleeds, re-bleeds, other coagulopathy)
- Relate to treatment for other injuries?
- Access to CT, MRI, POCUS







Photo credit: Dr Mykola Demyaniuk, TCCC instructor and anesthesia MD at forward stabilization point

Lesson Shared (7): patient assessment

- Conventional warfare and the primary survey
- UKR casualties being hit with shrapnel from blast without PPE
- Small wounds – big problems
- Burns
- Decompensation, patient changes and need for reassessment - PFC
- Casualty dump with no MOI -> the primacy of the primary survey
- TCCC card – DATA!





Tight space

Compressed oxygen

Monitors that can't be used on the road

Post DCS, central line, intubation, propofol, GHB, fentanyl, ketamine, six units of blood, hypothermic, hypotensive, no access to pressers, external fixation, limited suction, antibiotics

GRAD rocket fire





МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ

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web:http://www.moz.gov.ua, код ЄДРПОУ 00012925

від _____ 20__ р. № _____ На № _____ від _____ р

**п. Богдан Чернявський,
Canada-Ukraine Foundation**

Шановний пане Богдане!

Міністерство охорони здоров'я України висловлює подяку за активну роботу на користь України в частині порятунку життя постраждалих від збройної агресії на території України.

МОЗ підтверджує актуальну потребу у автомобілях швидкої медичної допомоги, а саме щодо трьох напрямків:

1. Автомобілі швидкої медичної допомоги (ambulances): тип С (виключно, відповідно до європейського стандарту EN 1789), обладнання відповідно до Примірною табеля оснащення структурних підрозділів системи екстреної медичної допомоги, затвердженого наказом МОЗ від 05.06.2022 № 1311.

Необхідна кількість: понад 500 одиниць.

Призначення: робота цивільних бригад екстреної (швидкої) медичної допомоги, які надають екстрену медичну допомогу у прифронтовій зоні та евакуюють постраждалих до закладів охорони здоров'я усює країни.

2. Броньований евакуаційний транспорт.

Необхідна кількість: понад 500 одиниць.

Призначення: робота на лінії вогняної небезпеки.

3. Медичні позашляховики типу Toyota Land Cruiser J78.

Необхідна кількість: понад 200 одиниць.

Призначення: швидка евакуація постраждалих у важкодоступних місцях.

Просимо розглянути зазначені потреби та погодити кінцеву пропозицію з МОЗ.

Контактна особа МОЗ з питань медичного транспорту: Павло Груленко +38(066)295 46 21.

З повагою

Міністр

Віктор ЛЯШКО

Direct Ministry of Health Request: critical care ambulance needs (“NOW” (9 months ago)

- Canada Ukraine Foundation (CUF)
- Critical care ambulances
- 500, 500, 200 (4X4s)
- Equipment, Training
- “ ... *the work of civilian emergency (ambulance) medical teams that provide emergency medical care in the near frontline areas and evacuate victims to health care institutions throughout the country.*”



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Міністерство охорони здоров'я України
АСУД “ДОК ПРОФ”
Міністерство охорони здоров'я України
№25-04/23216/2-22 від 04.10.2022
КЕП Ляшко Віктор Кирилович
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Burns

Exposure

Fluids

Patient data to higher echelons of care



Lesson Shared (8): be ready for the gamut of patient demographics

- Newborns, infants, pediatrics, geriatrics and special needs patients
- high volume military trauma outside the typical “fit, healthy, 18-40ish” range
- NCD medications and abnormal physiology
- comorbidities, lethal diamond
- CPGs: for peds? For geriatrics? A special pathway or make doctrine more inclusive?







Lesson Shared (9): clinical governance

- Nurses
- MDs
- Paramedics, EMTs, Medics, Feldishers
- Scope of practice
- What is your accountability and to whom?
- Letters, IDs, associations and security
- Freedom of movement
- NATO interoperability – governance



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[https://jts.amedd.army.mil/assets/docs/cpgs/JTS_Clinical_Practice_Guidelines_\(CPGs\)/Frozen_Deglycerolized_Red_Blood_Cells_11_Jul_2016_ID26.pdf](https://jts.amedd.army.mil/assets/docs/cpgs/JTS_Clinical_Practice_Guidelines_(CPGs)/Frozen_Deglycerolized_Red_Blood_Cells_11_Jul_2016_ID26.pdf)
- JTS Whole Blood Transfusion CPG, 15 May 2018
[https://jts.amedd.army.mil/assets/docs/cpgs/JTS_Clinical_Practice_Guidelines_\(CPGs\)/Whole_Blood_Transfusion_15_May_2018_ID21.pdf](https://jts.amedd.army.mil/assets/docs/cpgs/JTS_Clinical_Practice_Guidelines_(CPGs)/Whole_Blood_Transfusion_15_May_2018_ID21.pdf)
- JTS Damage Control Resuscitation CPG, 12 Jul 2019
[https://jts.amedd.army.mil/assets/docs/cpgs/JTS_Clinical_Practice_Guidelines_\(CPGs\)/Damage_Control_Resuscitation_12_Jul_2019_ID18.pdf](https://jts.amedd.army.mil/assets/docs/cpgs/JTS_Clinical_Practice_Guidelines_(CPGs)/Damage_Control_Resuscitation_12_Jul_2019_ID18.pdf)
- Office of The Surgeon General, Borden Institute, Emergency War Surgery, 5th U.S. Edition, Chap 33. 2018
<https://www.cs.amedd.army.mil/Portlet.aspx?ID=cb88853d-5b33-4b3f-968c-2cd95f7b7809>
- [tps://www.statista.com/statistics/530097/defence-budget-relative-to-gdp-finland/#:~:text=In%202022%2C%20the%20defense%20budget,early%20two%20percent%20in%202022](https://www.statista.com/statistics/530097/defence-budget-relative-to-gdp-finland/#:~:text=In%202022%2C%20the%20defense%20budget,early%20two%20percent%20in%202022).
- <https://www.statista.com/statistics/695409/military-spending-as-a-share-of-gdp-in-sweden/>



Additional Resources

- Joint Trauma System / DoD Clinical Practice guidelines: <https://jts.health.mil/> - https://jts.health.mil/index.cfm/PI_CPGs/cpgs
- Deployed Medicine: <https://deployedmedicine.com/>
- Joint Committee for Tactical Combat Casualty Care (JCoTCCC) <https://www.facebook.com/CoTCCC/>
- TCCC in Ukrainian – full complement of resources: <https://tccc.org.ua/collection/kurs-bojovih-ryatuvalnikiv>



Thank you

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