

# UKR Report from the Field: TCCC in the multidomain battlespace



John Quinn, MD, PhD, MPH, EMT-P  
Prague Center for Global Health  
Institute of Hygiene and Epidemiology  
First Faculty of Medicine  
Charles University  
[john.quinn@lf1.cuni.cz](mailto:john.quinn@lf1.cuni.cz)



FIRST FACULTY  
OF MEDICINE  
Charles University

Prague Center for Global Health

# Disclaimer and Disclosures

The views expressed in this presentation and all written reports are those of John Quinn alone and do not reflect the official policy or position of the Department of Defense, the Organization for Security Cooperation (OSCE), any NGO or any U.S. Governmental agency or body. No external funding has been used to prepare this presentation and qualitative data.

There are no additional financial, professional or ethical disclosures to report. The conclusions in this report are entirely of the author alone. This presentation is intended for educational purposes only and does not replace independent professional judgement or clinical practice.

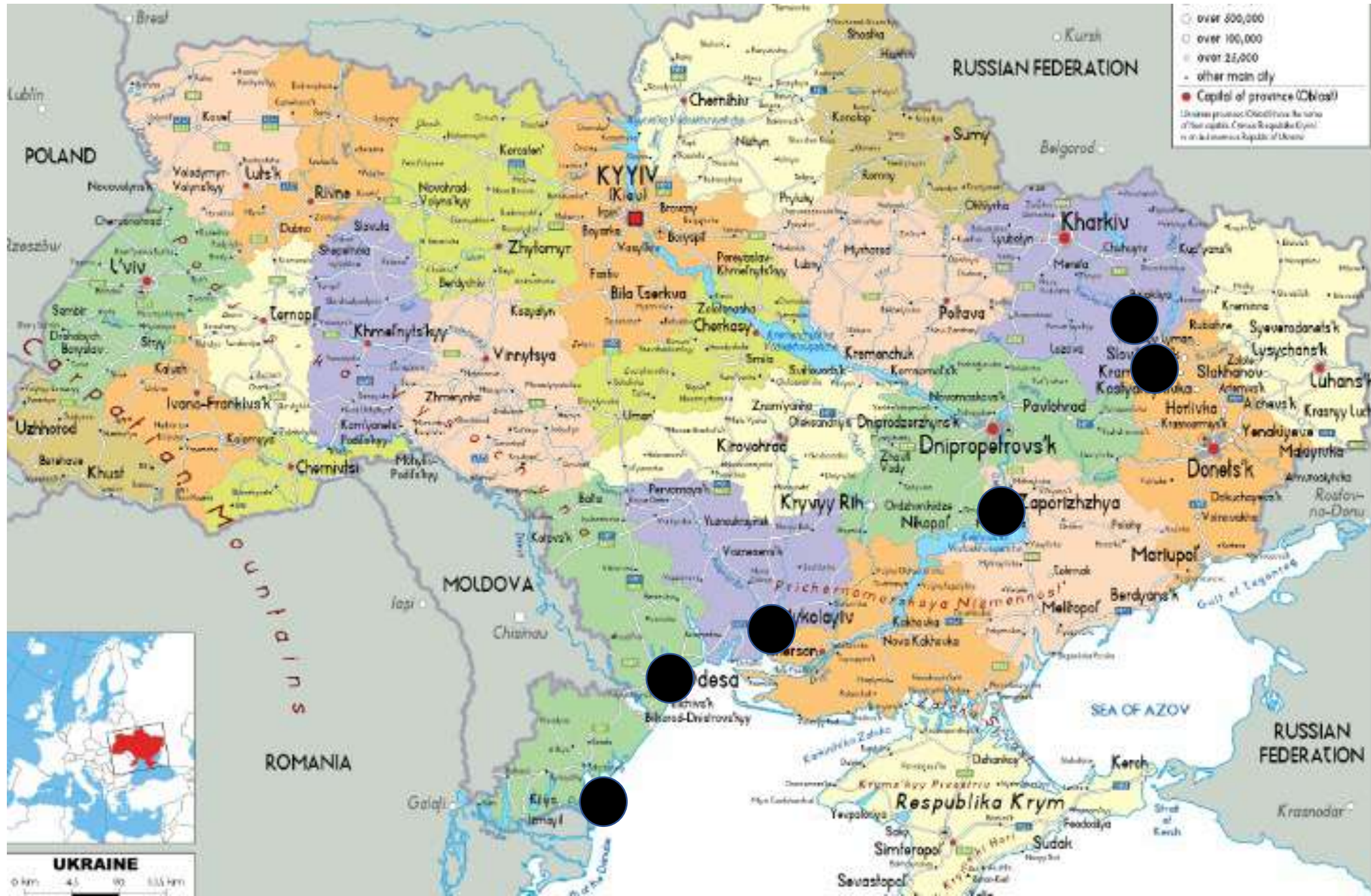
# Overview and Objectives

## **Reduction of preventable morbidity and mortality through lessons learned and lesson shared**

- Setting the scene: 2014 to February 2022
- Lessons learned: a walk through
- Summary and conclusion







desa

●

●

●

●

●



# Morbidity and Mortality Data to date

- 12 to 14 million people displaced
- 6-30,000+ civilians dead
- 11 to 14,000 Ukrainian soldiers dead
- 30 to 60,000 Russian soldiers and mercenaries likely dead
- Healthcare infrastructure decimated
- Anecdotally, 20 to 40% of Ukrainian warfighters die from preventable injuries / complications
- Civilian death count grows daily – vulnerable communities at high risk





Limited access to appropriate tourniquets, training

Ukraine: TXA IM

Limited access to calcium replacement therapy

Widespread crystalloid use

Recent 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.

# Setting the scene: Point of Injury (PoI) to Role 1 / Role 2

## ***Challenges***

- **Onset**: no standardized TCCC, no standardized tourniquet, no legal access to blood or blood products in the prehospital environment
- Limited fit for purpose medical evacuations vehicles, no operational / deployable mobile Role 1 / 2
- Contested air: rotary and fix wing limited
- Prolonged field care

## ***Assets and available resources***

- European infrastructure: roads, bridges, hospitals/clinics
- Anesthesiologists, surgeons, nurses and ancillary medical staff – significant clinical expertise
- Over seven years of fighting Russia in hybrid war (LL/LL)
- Diaspora + the international community

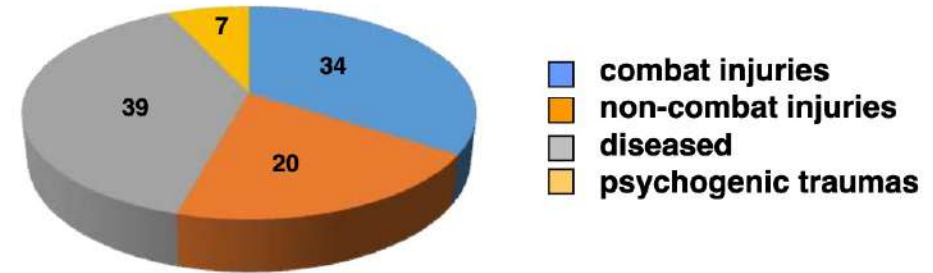




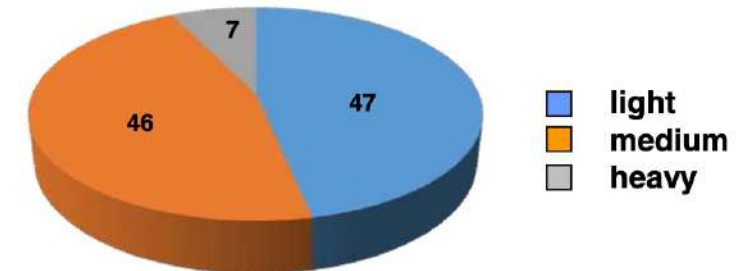


SANITARY LOSSES

Categories



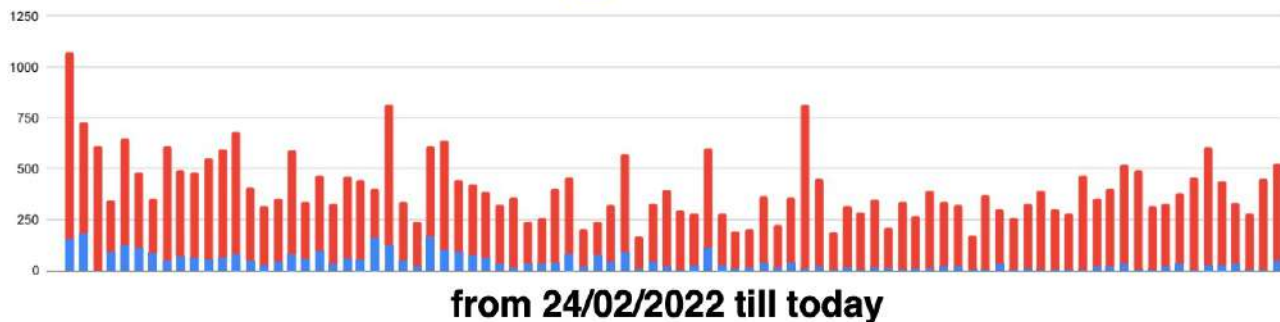
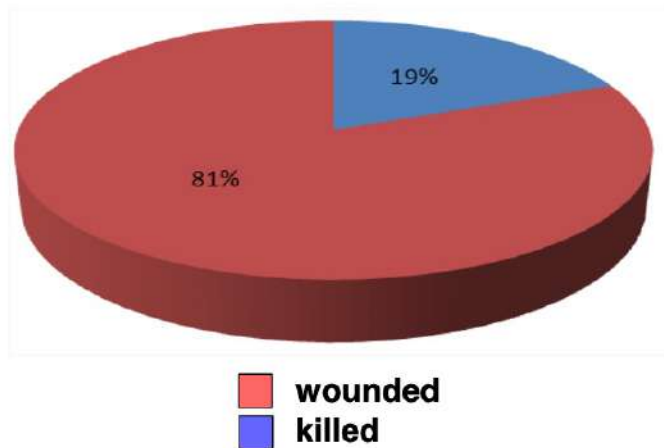
Injury severity



UNCLASSIFIED 11

MEDICAL FORCES COMMAND  
ARMED FORCES OF UKRAINE

TOTAL LOSSES



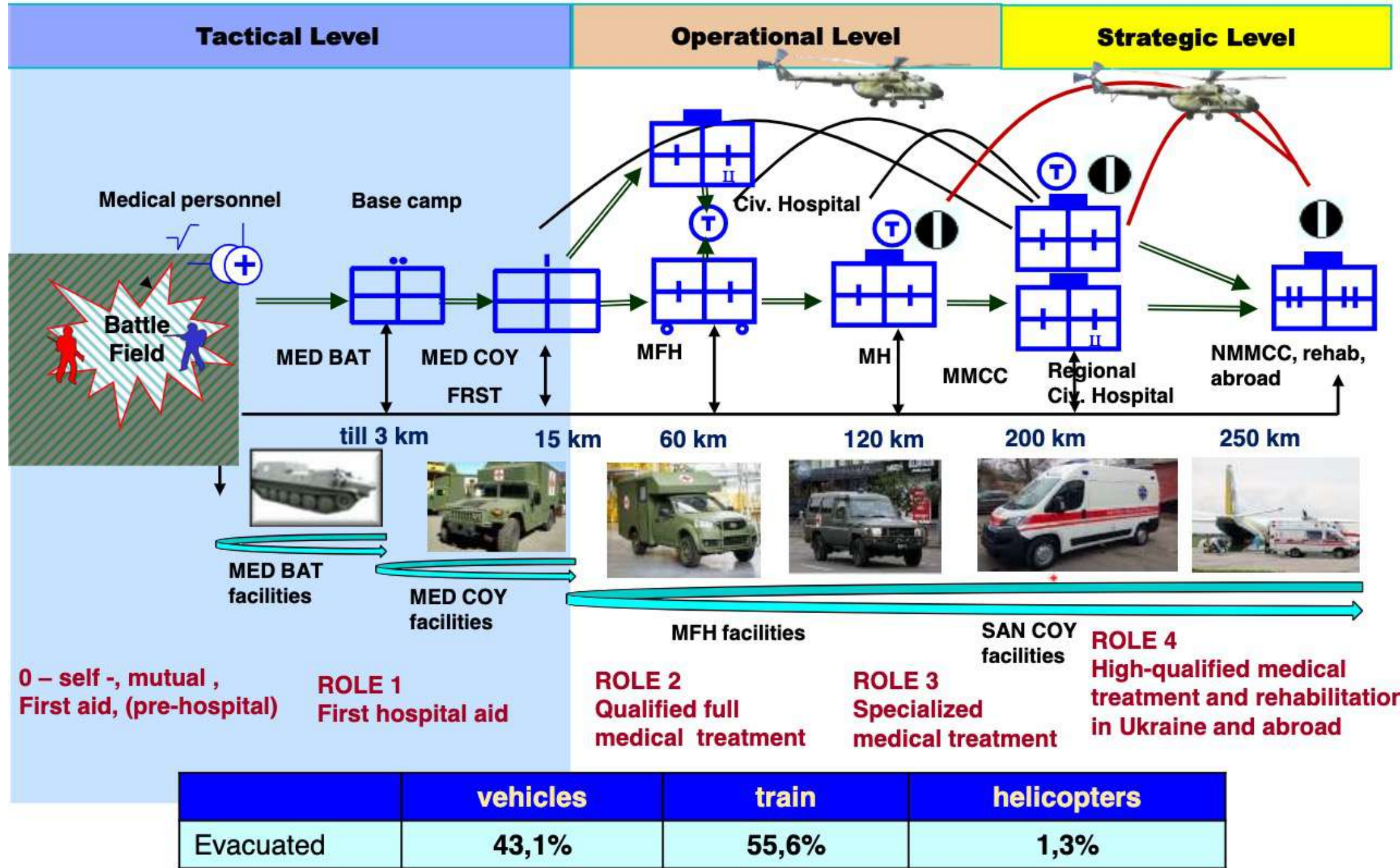
UNCLASSIFIED 9

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

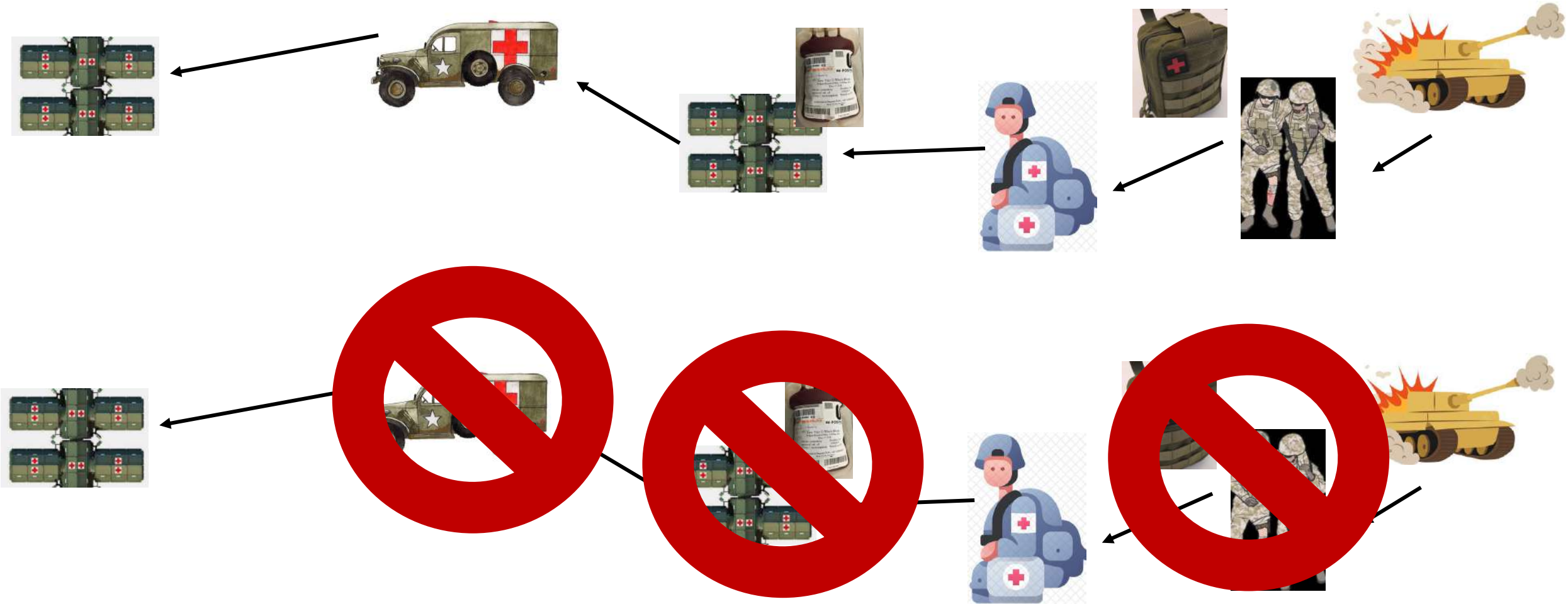




# C2



# Anecdotal experience, different fields of fire



Preventable morbidity ↑ and mortality ↑



FIRST FACULTY  
OF MEDICINE  
Charles University

Prague Center for Global Health





# Lesson Learned (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 Learned (2): tourniquets

- Training
- Timing
- Conversion
- Quality
- Precautionary (*en route casualty care*)
- DCR/DCS







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





# Lesson Learned (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 Learned (4): antibiotics

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





## Lesson Learned (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
- Ambulance transfer points vs CCPs
- Patient packaging: basics, good, better and best
- Patient data transfer (SIGNAL)









# Interoperability

- Micro
- Macro
- TCCC cards, JTS+NATO
- CBRNE threat: Ukraine, neighboring countries and NATO reaction force
- Clinical governance
- Evacuation chain from POI to Role 4 / outside UKR





## Lesson Learned (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



# MACE 2

Military Acute Concussion Evaluation



Застосуйте MACE 2 як можна швидше після отримання травми.

Ім'я військовослужбовця: \_\_\_\_\_

ID номер: \_\_\_\_\_ Відділення та підрозділ: \_\_\_\_\_

Дата травмування: \_\_\_\_\_ Час травмування: \_\_\_\_\_

Оглядач: \_\_\_\_\_

Дата огляду: \_\_\_\_\_ Час огляду: \_\_\_\_\_

**Ціль:** MACE 2 — мультимодальний інструмент, який допомагає оцінити та діагностувати струс мозку. Оцінка, кодування та покрововість, які необхідно виконати після завершення, знаходяться наприкінці MACE 2.

**Час:** MACE 2 є найбільш ефективним, якщо його використовувати якомога ближче до моменту травми. MACE 2 можна повторити для оцінки одужання.

## СИМПТОМАТИКА

Оцініть наявність симптомів у пацієнта за Шкалою коми Глазго (ШКТ) 13-15.

- Погіршення рівня свідомості
- Двоїться в очах
- Підвищена неспокійність, агресивна чи збуджена поведінка
- Постійне блювання
- Результати пристрою для виявлення структурної травми головного мозку (за наявності)
- Судоми
- Слабкість або поколювання в руках або ногах
- Сильний або наростаючий головний біль

**Відкладіть MACE 2, якщо присутні будь-які симптоми. Негайно зверніться до вищого рівня надання допомоги та розгляньте термінову евакуацію відповідно до порядку евакуації/тактичної бойової допомоги пораненим (TCCC).**

**Негативний результат для всіх по всім вищезгаданим симптомам**

Продовжуйте MACE 2 і спостерігайте за симптоматикою під час оцінювання.

# MACE 2

Military Acute Concussion Evaluation

Use MACE 2 as close to time of injury as possible.

Service Member Name: \_\_\_\_\_

DoDI/EDIPI/SSN: \_\_\_\_\_ Branch of Service & Unit: \_\_\_\_\_

Date of Injury: \_\_\_\_\_ Time of Injury: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Evaluation: \_\_\_\_\_ Time of Evaluation: \_\_\_\_\_

**Purpose:** MACE 2 is a multimodal tool that assists providers in the assessment and diagnosis of concussion. The scoring, coding and steps to take after completion are found at the end of the MACE 2.

**Timing:** MACE 2 is most effective when used as close to the time of injury as possible. The MACE 2 may be repeated to evaluate recovery.

## RED FLAGS

Evaluate for red flags in patients with Glasgow Coma Scale (GCS) 13-15.

- ❑ Deteriorating level of consciousness
- ❑ Double vision
- ❑ Increased restlessness, combative or agitated behavior
- ❑ Repeat vomiting
- ❑ Results from a structural brain injury detection device (if available)
- ❑ Seizures
- ❑ Weakness or tingling in arms or legs
- ❑ Severe or worsening headache

**Defer MACE 2 if any red flags are present. Immediately consult higher level of care and consider urgent evacuation according to evacuation precedence/Tactical Combat Casualty Care (TCCC).**

- ❑ **Negative for all red flags**  
Continue MACE 2, and observe for red flags throughout evaluation.











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

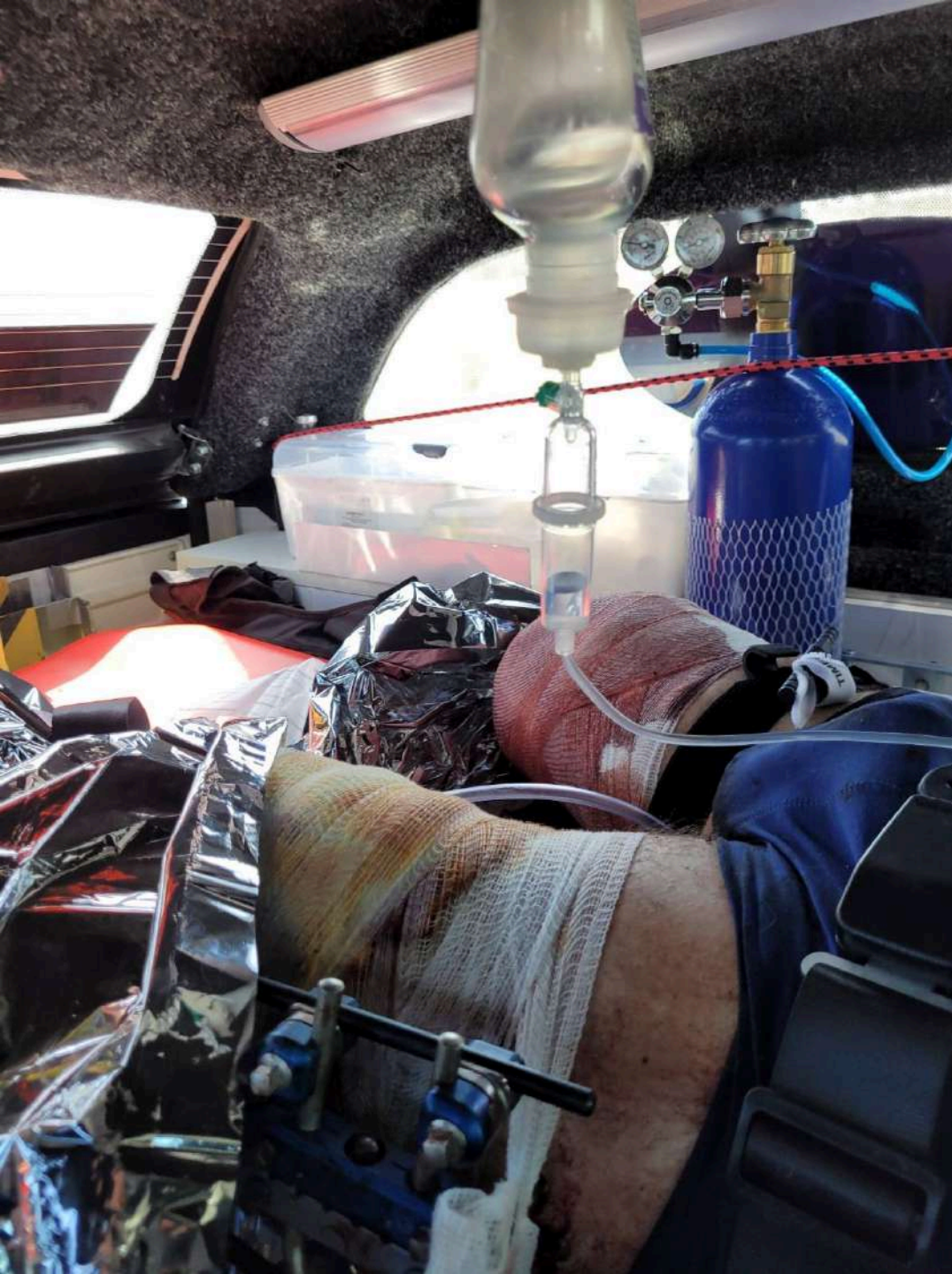


# Lesson Learned (7): patient assessment

- 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
- Casualty dump with no MOI -> the primacy of the primary survey
- TCCC card







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







Burns

Exposure

Fluids

Patient data to higher echelons of care



## Lesson Learned (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 Learned (9): clinical governance

- Nurses
- MDs
- Medics
- Scope of practice
- What is your accountability and to whom?
- Letters, IDs, associations and security
- Freedom of movement







*Committed to the health of our forces*

ABOUT US

NEWS AND EVENTS

RESOURCES

BRANCHES

COURSES

CONTACT



# Welcome at NATO MILMED COE

## Lesson Learned (N<sub>x</sub>): 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

# Key focus in Global Health Engagement (GHE): winter at war

- All health and health security related activities focused on: readiness, interoperability, lessons learned/lessons shared, and reduction of both morbidity and mortality of the NATO and NATO partner Warfighter
- Training is a two-way street: lessons learned (LL), lessons shared (LS), lessons lost (LL)
- Evacuation chain
- Training far forward – NATO/partners far forward
- Support with reaction force
- Protect the air?
- Preventative engagement?
- Deterrence and collective defense – drive the initiative

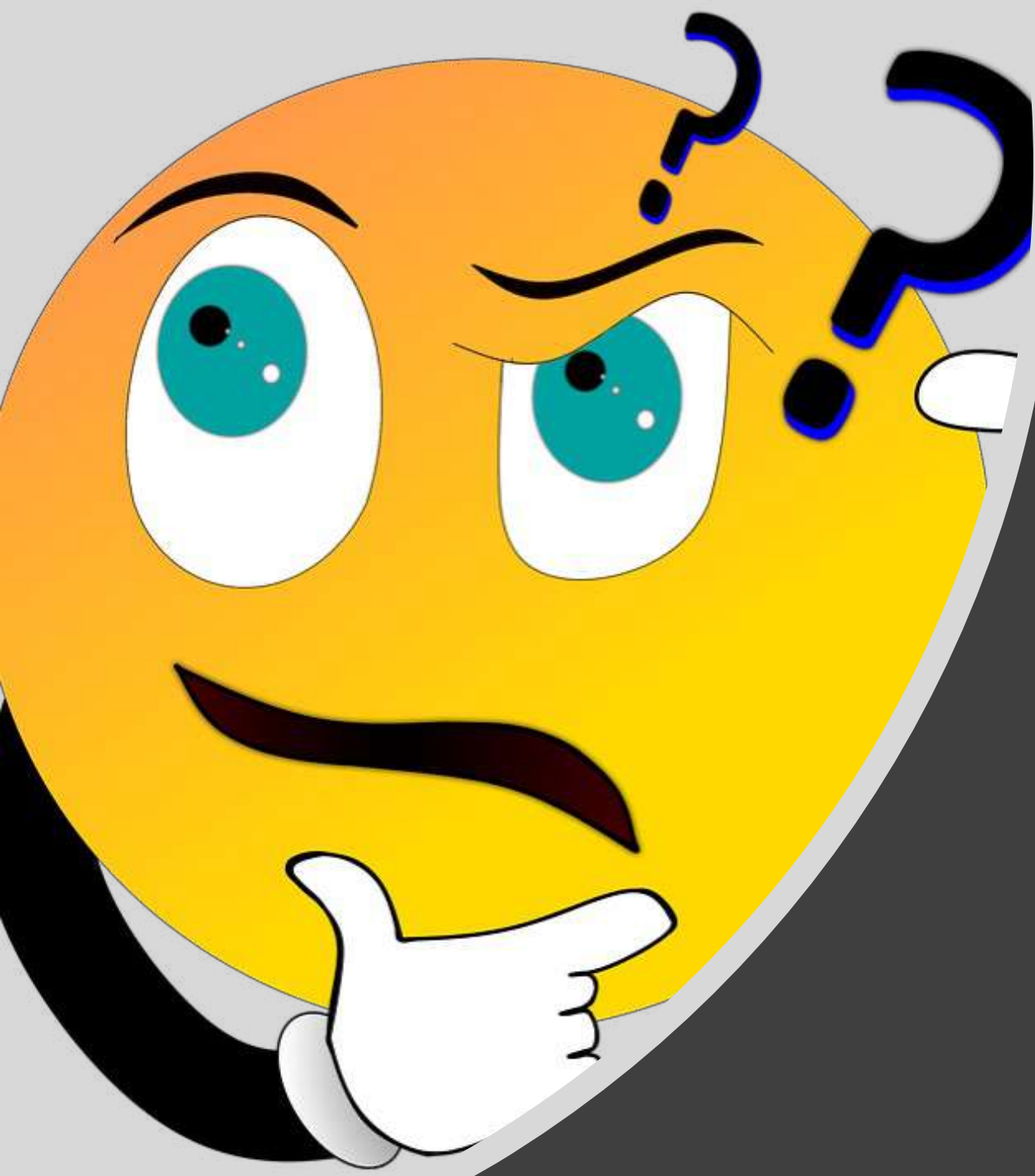




# The Enemy

- Are preparing
- Are adapting
- Are listening
- Are training
- Peer adversary





# Challenging questions to consider

- Do Clinical Practice Guidelines (TCCC/TECC, RDCR/DCR/DCS) hold true in the presence of conventional weapon systems fired by design against a peer adversary?
- What data is needed to best answer adjustments to CPGs? What data would be needed most to make the quickest and greatest impact?
- Evac Chain: Pushing Role 2 capabilities to Role 1, en route casualty care and critical care aspects of the post DCR/DCS patient requiring transport in multi-domain battle, what next?





# Summary

- Lessons learned – lessons shared – lessons lost
- Disruption: CPGs and pushing Role 2 level of care to Role 1
- En route casualty care – critical care transport
- Mental health





# Thank you

John Quinn, MD, PhD, MPH, EMT-P  
Prague Center for Global Health  
Institute of Hygiene and Epidemiology  
First Faculty of Medicine  
Charles University

[www.pcgh.lf1.cuni.cz](http://www.pcgh.lf1.cuni.cz)

+420608246032

[john.quinn@lf1.cuni.cz](mailto:john.quinn@lf1.cuni.cz)

[John.quinn5@nhs.net](mailto:John.quinn5@nhs.net)



**CANADA-UKRAINE FOUNDATION**  
**FONDATION CANADA-UKRAINE**  
**КАНАДСЬКО-УКРАЇНСЬКА ФУНДАЦІЯ**



FIRST FACULTY  
OF MEDICINE  
Charles University

Prague Center for Global Health



# References, attributions, contributions, and resources

- Tien, H., & Beckett, A. (2022). Medical support for future large-scale combat operations. *Journal of Military, Veteran and Family Health*, (aop), e20210006.
- PLOS Medicine Editors. (2022). Ukraine conflict: Prioritizing lives and health. *PLoS Medicine*, 19(5), e1004007.
- Chumachenko, D., & Chumachenko, T. (2022). Ukraine war: The humanitarian crisis in Kharkiv. *BMJ*, 376.
- GENE, I. O. M. I. H., & CARASIL, O. (2022, April). Vinnytsia National Pirogov Memorial Medical University Vinnytsia, Ukraine. In *The 10 th International scientific and practical conference “International scientific innovations in human life”*(April 13-15, 2022) Cognum Publishing House, Manchester, United Kingdom. 2022. 668 p. (p. 101)
- Rubin, R. (2022). Physicians in Ukraine: Caring for Patients in the Middle of a War. *JAMA*, 327(14), 1318-1320.
- Mahase, E. (2022). “Same tactics, same injuries”: the targeting of healthcare in Syria and Ukraine. *bmj*, 378.
- Gostin, L. O., & Rubenstein, L. S. (2022). Attacks on health care in the war in Ukraine: International law and the need for accountability. *JAMA*, 327(16), 1541-1542.
- Fontanarosa, P. B., Flanagan, A., & Golub, R. M. (2022). Catastrophic health consequences of the war in Ukraine. *JAMA*, 327(16), 1549-1550.
- Fong, A., & Johnson, K. (2022). Responding to the war in Ukraine. *Canadian Journal of Emergency Medicine*, 1-2.
- Roborgh, S., Coutts, A. P., Chellew, P., Novykov, V., & Sullivan, R. (2022). Conflict in Ukraine undermines an already challenged health system. *The Lancet*, 399(10333), 1365-1367.
- Piven, D. A., & Us, Y. O. (2022). Public Health Projects in Ukraine.
- Canada-Ukraine Foundation (CUF)

# Additional Resources

- Joint Trauma System / DoD Clinical Practice guidelines: <https://jts.health.mil/> - [https://jts.health.mil/index.cfm/PI\\_CPGs/cpgs](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>





## МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ

вул. М.Грушевського, 7, м. Київ, 01601, тел. (044) 253-61-94, E-mail: moz@moz.gov.ua,  
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 Примірного 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 усю країну.

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**

Павло Груленко +38(066) 295 4

Міністерство охорони здоров'я України

25-04/23216/2-22 від 04.10.2022

АСУД "ДОК ГРОУД 3"  
Міністерство охорони здоров'я України  
№25-04/23216/2-22 від 04.10.2022  
КЕП Ляшко Віктор Кирилович  
SBEZD9E7F900307B04000001D8A2D00CCD29000



# Direct Ministry of Health Request: critical care ambulance needs (NOW)

- 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.”



FIRST FACULTY  
OF MEDICINE  
Charles University

Prague Center for Global Health

## Affiliations, locations, media, operational security – “*this ain’t about me*”

- Patriot Defense, Medsanbat / Viktor and Elena Pinchuk Foundation
- Canada-Ukraine Foundation (CUF)
- Migrant Offshore Aid Station (MOAS)
- GoDocs (2022/2023)
- Academics, LF1
- MoD / Armed Forces of Ukraine (AFU)
- OSCE Special Monitoring Mission for Ukraine (SMM)
- NATO Military Medical Center of Excellence (“MilMed CoE”)
- Operational security: no photos, no videos, no waypoints.
- Locations
- Timeline iteration: February 15<sup>th</sup> – July 1<sup>st</sup> 2022