

Annual Report 2025



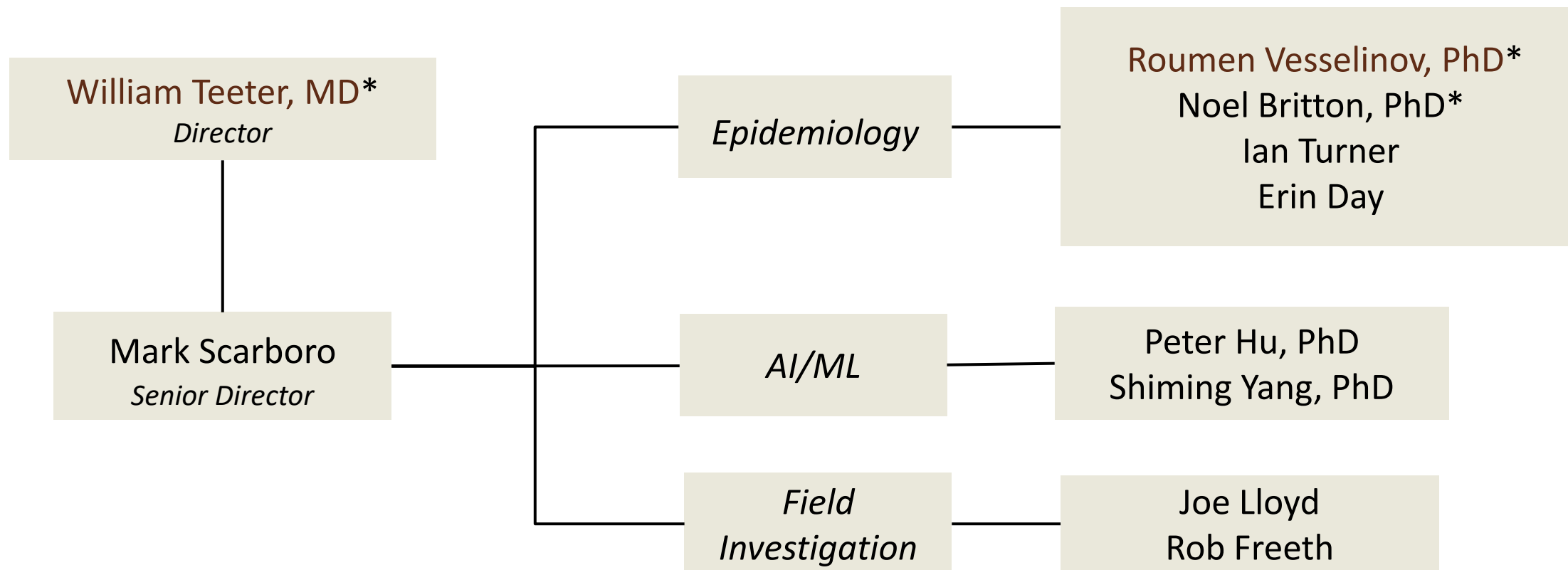
*Charles "McC" Mathias National Study Center
for Trauma and EMS*

Mission Statement

"The Study Center's primary mission is research, with particular emphasis on establishing national policies related to prevention, treatment, acute care and rehabilitation, trauma and emergency medical care delivery systems, disaster epidemiology and management, injury surveillance, and data collection. It shall serve as the primary research center for the State Emergency Medical Services System."

MD Education Code § 13-513 (2024)

NSC Organizational Chart



*Faculty Appointment

NSC Core Faculty

[William Teeter, MD*](#)

Director, Charles McC Matthias National Study Center
Associate Professor of Emergency Medicine
University of Maryland School of Medicine

[Roumen Vesselinov, PhD](#)

Assistant Professor of Epidemiology & Public Health
University of Maryland School of Medicine

[Rosemary Kozar, MD, PhD](#)

Professor of Surgery
Director of Translational Research Shock Trauma
University of Maryland School of Medicine

[Shiming Yang, PhD*](#)

Associate Professor of Anesthesiology
Co-Director, PRIME-AI Lab
University of Maryland School of Medicine

[Thomas M. Scalea, MD](#)

The Honorable Francis X. Kelly Distinguished Professor in Trauma
Physician in Chief, Shock Trauma Center
University of Maryland School of Medicine

[Peter F. Hu, PhD*](#)

Professor of Anesthesiology, Surgery, and Epidemiology & Public Health
Chief Technologist, National Study Center for Trauma & EMS
R Adams Cowley Shock Trauma Center
University of Maryland School of Medicine

[Deborah M. Stein, MD, MPH](#)

Professor of Surgery
Director Adult Critical Care Services, University of Maryland Medical Center

* PRIME-AI Investigators

NSC Faculty

New in 2026

[Elizabeth Powell, MD](#)

Associate Professor of Emergency Medicine and Surgery
Advanced Resuscitation in Combat Casualty Care (ARC3) Laboratory
University of Maryland School of Medicine

[Douglas J. Floccare, MD, MPH](#)

Maryland State Air Medical Director, MIEMSS
Assistant Professor of Emergency Medicine
University of Maryland School of Medicine

[Matthew Jason Levy, DO, MSc](#)

Professor of Emergency Medicine
The Johns Hopkins University School of Medicine



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SCHOOL OF MEDICINE

CHARLES McC. MATHIAS, JR., NATIONAL
STUDY CENTER FOR TRAUMA AND
EMERGENCY MEDICAL SYSTEMS

Report Summary

Collaborations / Publications

Project Spotlights

- IODES
- CIREN
- CAVALIER
- Regional Highway Safety

NSC Collaboration

Collaboration with IHC, STAR, and other researchers

- Multiple projects evaluating state-of-the-art care in trauma

MIEMSS Research Interest Group (RIG)

- Epinephrine and Cardiac Arrests in Maryland
- Transfer of Care Times and Factors
- Patient survivability post EMS contact

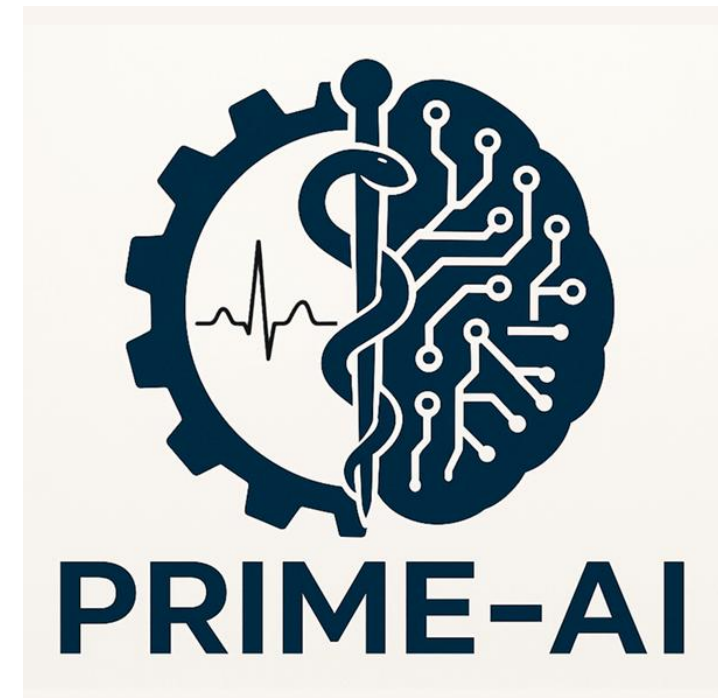
Multiple papers submitted and published in 2025

- Early trauma-induced coagulopathy, drugs and toxicology, trauma clinical outcomes, built environment and injuries, among others

Collaboration Spotlight

Precision Research in Medicine and Engineering at University of Maryland, Baltimore

- Big data capture of real-time clinical data and continuous physiologic waveforms
- AI Machine Learning applied to big clinical data with a trauma focus
- Predictive Analytics and Clinical Decision Support tools
- Multi-view videography and analytics in trauma resuscitation



<https://www.medschool.umaryland.edu/anesthesiology/research/labs/prime-ai-lab/>

Collaboration Spotlight

25+ years of data collection in real-world trauma environment

Physiologic Waveforms: ~100,000,000 datapoints/patient/day

Big Clinical Data ~140,000,000 data points per year

3,700,000 gigabytes of data

Unified Dataset of 7,000+ Trauma Patients
5000+ prehospital helicopter MEDEVAC Patients



U.S. ARMY



Maryland Institute for
Emergency Medical Services Systems

National Collaboration Spotlight

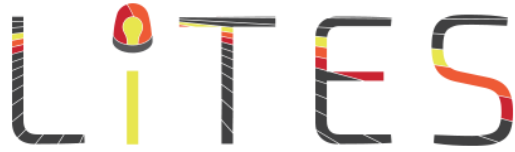


Department of Defense-funded consortium of nearly 50 trauma centers in the United States and Canada to continue a clinical research trial program that is advancing trauma care.

Trials proposed by Department of Defense with support given to centers for multi-institutional enrollment in both field and in-hospital spaces

National Collaboration Spotlight

<https://www.litesnetwork.org/cavalier/>



Linking Investigations in Trauma
and Emergency Services



Calcium and Vasopressin following Injury Early Resuscitation trial (CAVALIER)

Randomized controlled trial examining whether giving calcium, vasopressin, or both earlier following injury would help severely injured patients that require blood transfusion.

NSC partnering with STC and MSPAC for coverage of the entire state

Exception from Informed Consent (EFIC) Campaign Completed by NSC – Awaiting IRB approval

Enrollment expected Q2 CY2026

Grants and Projects

- **USAF Enroute Care Triage Clinical Decision Support** - \$3,000K
 - Extended to \$5,000K total – FLIGHTNET/FORECAST
- **DCHSO Seat Belt Study FY25** - \$250K, FY26-\$200K
- **MHSO Seat Belt Study FY25** - \$190K, FY26 - \$180K
- **CIREN Research** - Transportation Data Linkage and Cost of Injury Analysis - \$87K
- **Safe Streets and Roads for All (SS4A)** Grant Program - \$642k
- **MHSO** 2 pilot studies: Aggressive and Reckless Driving, Traffic Stops and Race in MD
- **Crash Injury Research & Engineering Network (CIREN)** - \$597k
- **CAVALIER Trial** - \$500k



Illness/Injury Outcomes Data Evaluation System (IODES)

Integration of multiple datasets

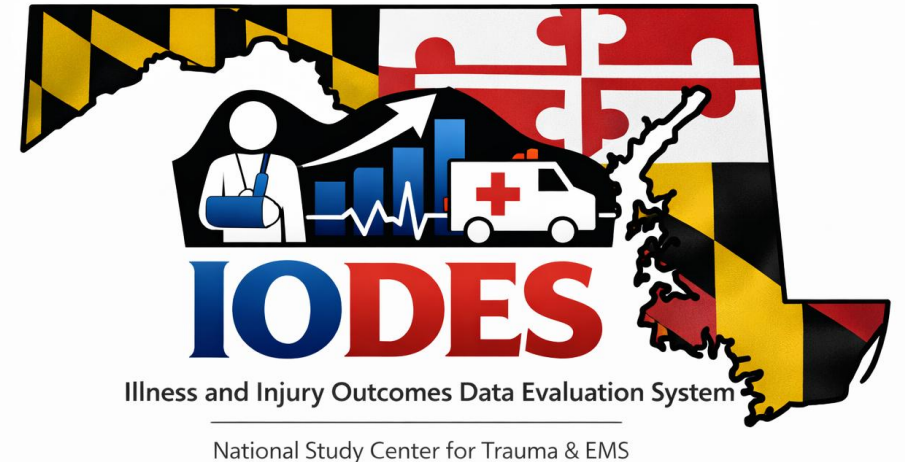
- EMEDS forms the keystone between event and hospital data
- HSCRC data (2016-2026) included in late 2025

IODES stores data in secure database at UMB

- Integrated and Useable data

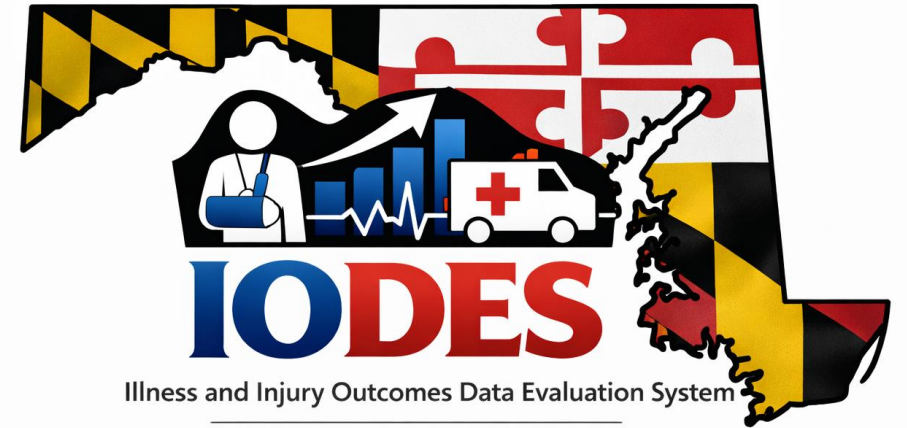
Data continuum

- Patient history, through event, hospital stay, and beyond hospital discharge



Illness/Injury Outcomes Data Evaluation System (IODES)

Collaboration with MIEMSS in 2026
to improve access to prehospital
data in support of NSC's mission to
the State EMS System

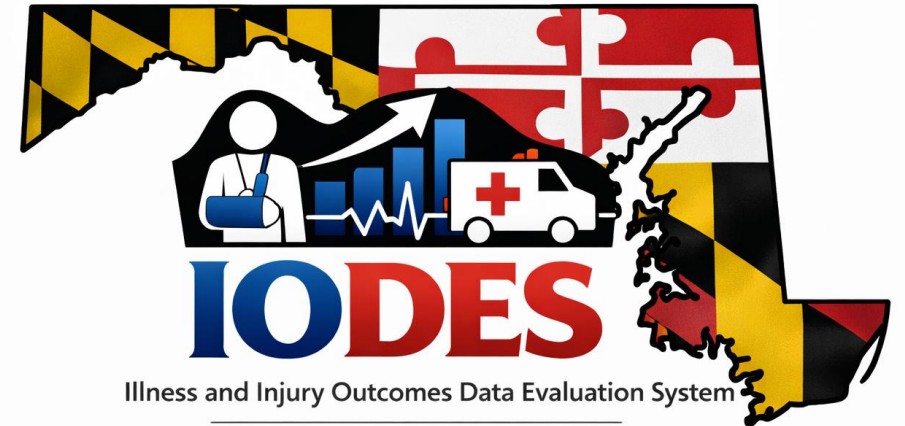


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Illness/Injury Outcomes Data Evaluation System (IODES)

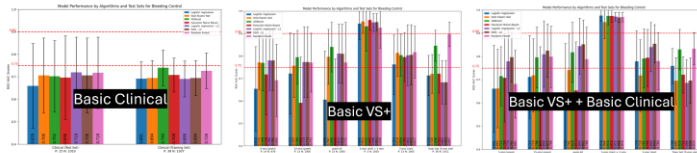
Planned inaugural projects in collaboration with MIEMSS and MSPAC

- WTA Multi-institutional Study: Early trauma-induced coagulopathy (eTIC)
- Whole blood program (Statewide)
- Outcome and Mortality following Motor Vehicle Collisions in Maryland

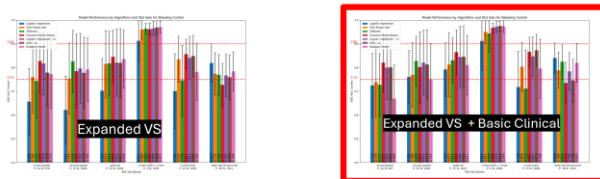


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TRIAGE CLINICAL DECISION SUPPORT (CDS) FOR PROLONGED FIELD CARE



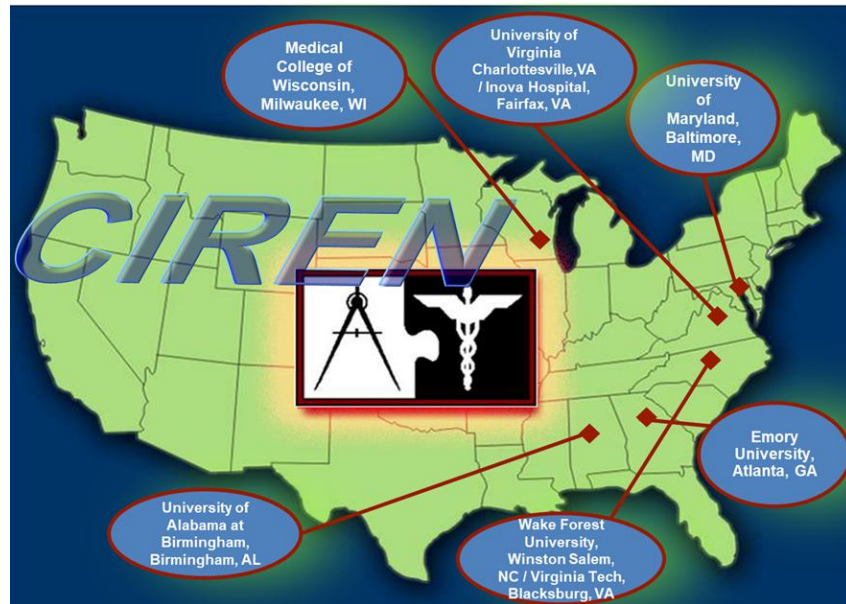
Bleeding Control



The military faces the likelihood of **large-scale combat operations (LSCO)** with extended prolonged prehospital care and the need for **life-saving interventions (LSIs)** during transport and upon arrival to Role 2 surgical capabilities.

Valid and reliable early warning systems will improve facility-based surgical team readiness, particularly in the **setting of multiple casualties** or non-compressible torso hemorrhage that is otherwise difficult to identify.

NHTSA Crash Injury Research and Engineering Network (CIREN)



NHTSA funded

- 5 year contract awarded - \$2.6M

Pedestrian cases

- Pursuing only fatal cases with DCIR

Motorcycle crash reconstructions

- 2025-2026

Continued focus on serious injury resulting from late model passenger vehicle crashes

Maryland and District of Columbia Highway Safety Office Seatbelt Projects

NSC will be manage the field data collection on seatbelt usage rates throughout the District of Columbia and Maryland.

Data collection will include information on the drivers and front seat passengers of: **passenger cars, vans, sport utility vehicles (SUVs), pick-up trucks, etc.**

Goal: Determine the percentage of seatbelt use within the District for mandatory reporting to NHTSA

MD Funding FY25: \$190K, FY26: \$180K

DC Funding FY25: \$250K, FY26: \$200K



Thank you!





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Questions?

[HTTPS://WWW.MEDSCHOOL.UMARYLAND.EDU/NSC_TRAUMA/](https://www.medschool.umaryland.edu/nsc_trauma/)