Maryland Institute *for*
Emergency Medical Services Systems

2023-2024 Annual Report

MIEMSS

The Maryland Institute for Emergency Medical Services Systems (MIEMSS) oversees and coordinates all components of the statewide EMS system, including planning, operations, evaluation, and research; provides leadership and medical direction; certifies and licenses EMS clinicians; conducts and supports EMS educational programs; operates and maintains a statewide communications system; designates trauma and specialty centers; licenses and regulates commercial ambulance services, and participates in EMS-related public education and prevention programs. MIEMSS provides the executive support for the EMS Board in reviewing and approving the budgets for agencies receiving funds from the Maryland EMS Operations Fund, developing and promulgating regulations and protocols, proposing EMS system legislation, licensing/certifying EMS clinicians, and conducting other EMS Board business. MIEMSS also provides the administrative and staff support for the Statewide EMS Advisory Council (SEMSAC) and five EMS regional councils.

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2023-2024 ANNUAL REPORT

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MISSION, VISION, AND KEY GOALS

MISSION

To provide leadership, coordination, oversight, and resources to ensure that Maryland's statewide emergency medical service (EMS) system delivers optimal care to reduce preventable deaths, disability, and discomfort.

VISION

To be a state EMS system acknowledged as a leader for providing the highest quality patient care and that is sought out to help other EMS systems attain the same level of performance.

KEY GOALS

1. Ensure EMS clinicians are optimally prepared and qualified for the care they are called upon to provide.
2. Ensure all aspects of the EMS system benefit from qualified EMS medical direction.
3. Ensure Maryland EMS educational programs meet the needs of EMS clinicians and the patients they serve.
4. Ensure EMS clinical care reflects best practices, statewide.
5. Develop systems of care appropriate for the emergency conditions encountered by Marylanders.
6. Ensure that EMS is considered part of the continuum of health care.
7. Develop and maintain EMS communications systems that are integrated and interoperable.
8. Support implementation of Next Generation 9-1-1.
9. Ensure the Maryland EMS Operations Fund is a sustainable source of support for system infrastructure.
10. Ensure that evaluation is part of the EMS culture at all levels.

MARYLAND EMS REGIONS

Maryland's EMS system is composed of five regions. Each region has a Regional EMS Advisory Council defined by regulation. Each council meeting covers a range of topics, including grants, training, EMS policies and protocols, legislation, and communications. Input from each Regional EMS Advisory Council is provided to the Statewide EMS Advisory Council for recommendation to the EMS Board. MIEMSS' regional coordinators support the councils, facilitate communication, and address regional EMS issues.

Clay B. Stamp, NRP
Chairman, EMS Board

FROM THE MARYLAND EMS BOARD CHAIR

On behalf of the Maryland State Emergency Medical Services (EMS) Board, I want to thank the MIEMSS team, our EMS system partners, allied agencies, and each of our EMS clinicians who ensure our statewide EMS system performs at its best, "getting the right patient to the right care in the right amount of time."

This was a very important year for the Maryland EMS system. As the system evolves, it requires continual resources to ensure the health and safety of the critically ill and injured. With the hard work and support of MIEMSS, R Adams Cowley Shock Trauma Center, Maryland State Firefighters Association, Maryland Fire and Rescue Institute, and Maryland State Police, we were able to secure the funding necessary to ensure all Marylanders continued access to prehospital emergency care and cost-free transport to the right trauma and specialty center to remedy their traumatic injuries. This underscores the resilience and excellence of the Maryland Emergency Medical Services system, which results from our cooperative relationships with our partners, stakeholders, and the many thousands of EMS professionals across the state.

I am honored and proud to work with our EMS Board members, the dedicated staff at MIEMSS, our EMS system partners, stakeholders, and all of our volunteer and career clinicians. I am continually impressed by the ongoing commitment to cooperative excellence. This excellence builds on the foundation of our collective successes, which are attributed to the Maryland "Vision 2030" EMS Plan. This roadmap for the future is reflected in the work highlighted in the annual report.

Theodore R. Delbridge, MD, MPH
Executive Director, MIEMSS

FROM THE EXECUTIVE DIRECTOR

There are things in our world that we have come to depend on, have confidence in, and perhaps even take for granted. Maryland's Emergency Medical Services (EMS) System is just that. Over its 50-year history, Marylanders have come to rely on the EMS system at times when health and wellbeing are at risk. They know that, when an emergency medical event occurs, expert help is promptly available. In 2023, Maryland EMS clinicians cared for more than 550,000 people whom they conveyed to emergency departments (EDs) and trauma centers for definitive care. They treated many more in the field.

The lion's share of investment in the EMS system is made by counties and cities, supporting vital, essential services for their citizens and visitors. Hospitals also make considerable investment to deliver state-of-the-art emergency care. Additionally, the people of Maryland fund important aspects of EMS system infrastructure through the Emergency Medical System Operations Fund (MEMSOF). This year, the General Assembly, led by Senator Guy Guzzone and Delegate Ben Barnes and their respective committees, on behalf of all Marylanders, ensured the viability of the MEMSOF for years to come. Their dedication to the health and safety of Marylanders serves as a reminder of the partnerships and collaborations that make a statewide EMS system possible. The MEMSOF supports the work of the Maryland Institute for Emergency Medical Services Systems (MIEMSS), the Maryland Fire-Rescue Institute (MFRI), the Maryland State Police Aviation Command operations related to EMS, and the R. Adams Cowley Shock Trauma Center. It also capitalizes the Amoss Fund, which provides money for local fire/EMS infrastructure. An important collaborator, providing valuable insight and advocacy, is the Maryland State Firefighters Association (MSFA).

Throughout the year, the importance of EMS and the perspective from its vantage in the health care system was apparent. An example was the work of the Hospital Throughput Workgroup led, at the request of the General Assembly, by the Maryland Hospital Association (MHA). EMS and its patients were often at the center of the workgroup's deliberations regarding emergency department crowding, waiting time, and throughput challenges. The work resulted in a report, *Maryland General Assembly Hospital Throughput Work Group Final Report*, issued in March 2024. One of the more important recommendations was for focus on these issues to continue. Thus, the General Assembly codified a commission to take the baton, and it, too, will include EMS representation and input.

The Health Services Cost Review Commission (HSCRC) and the MHA also considered EMS perspectives when challenging hospitals to engage in the emergency department dramatic improvement effort (EDDIE). Now, monthly, HSCRC receives from MIEMSS hospital-specific data for the preceding month regarding EMS-to-ED transfer of care time intervals, important to patients and for EMS operations. The data reveal that improvements are occurring.

MIEMSS also participated on the Commission on Trauma Funding in Maryland, which convened to assess the need and options to provide stabilizing funds to ensure the future of the state's trauma centers. As a result of the commission's work, collaboration among EMS system partners, and legislator champions, the General Assembly, on behalf of Marylanders committed the financial support necessary to maintain a robust system and resources to care for seriously injured people.

The challenges we faced in addressing the COVID-19 pandemic are slowly fading in our rearview mirror. One incredible effort to address an important need was the Critical Care Coordination Center (C4), which suspended operations in June 2024. Its funding source, a grant from the Centers for Disease Control and Prevention, expired. During nearly 43 months, the C4 fielded more than 7,000 calls from emergency departments and hospital clinicians trying to match their patients' intensive care needs with available resources anywhere. At one time or another, each hospital in Maryland was a referring hospital and each hospital was a receiving hospital. The C4 intensivists, pediatricians, and coordinators found the right care for many patients outside of Maryland. Perhaps even more impressive and just as important, in nearly 30% of cases, the assistance and guidance they provided obviated the need for a patient transfer at all, reserving valuable resources for others in need.

Each year, we update The Maryland Medical Protocols for Emergency Medical Services, the guide used by EMS clinicians to deliver consistent, optimal care throughout the state. This year, for the first time, the update is available as an app on the two common platforms. As we continue to refine the product, we hope it makes protocols more readily available to clinicians when they need them for reference.

We are working in earnest to debut additional innovations in the coming months. A new public access automatic external defibrillator (AED) registry will replace the one that is being retired. It will be designed to support AED deployments in grocery stores and restaurants, as mandated, and co-location of naloxone with AEDs. A new Maryland Emergency Medical Alerting Database (MEMRAD) will roll out to modernize communications with hospitals and emergency departments and support a new Emergency Department Advisory System (EDAS) to replace the current County Hospital Alert Tracking System (CHATS).

This report details many of the contributions and accomplishments of a multitude of EMS system partners and collaborators. Without their shared goal of excellence for all Marylanders and visitors to our state, the EMS system that serves us would not be what it is. However, what this report cannot possibly adequately convey is the depth of commitment and dedication of 20,000 emergency medical dispatchers, emergency medical responders, emergency medical technicians, cardiac rescue technicians, and paramedics. Collectively, at every hour of every day they stand ready to bring their A-game to people at their times of greatest need. They are the fabric of the EMS system; its heart and soul. We owe them our admiration and gratitude.

Thank you for your interest in this report and Maryland's Emergency Medical Services System.

Office of the State EMS Medical Director

The Office of the State EMS Medical Director (OMD) ensures that patients who interact with the Maryland EMS system receive consistent, high-quality out-of-hospital medical care. The OMD provides leadership and coordination for state medical programs, protocols, and quality assurance. The office closely coordinates efforts with the regional programs and clinical integration offices. OMD promotes creative, responsive, and evidence-based programs for the delivery of medical care to Maryland residents and visitors.

The Maryland Protocols for Emergency Medical Services

To reflect best practices and evidence-based medicine, *The Maryland Medical Protocols for Emergency Medical Services* are updated annually by the Protocol Review Committee. This committee incorporates multidisciplinary input from medical directors, emergency physicians, nurses, and EMS clinicians from across the state. The State EMS Medical Director, Timothy P. Chizmar, MD, presented proposed protocol changes for 2024 to the Statewide EMS Advisory Council and the Maryland EMS Board for approval.

The Maryland Medical Protocols for Emergency Medical Services was updated with the following significant additions and modifications, which took effect on July 1, 2024:

- **Allergic Reaction/Anaphylaxis:** This administrative change creates consistency in the indications for treatment between the Allergic Reaction and Anaphylaxis protocols. For ease of reference, the Allergic Reaction and Anaphylaxis protocols were also moved next to each other in the book.
- **Asthma/COPD:** This modification eliminates the need for paramedics to consult a base station for repeat doses of albuterol when treating adult and pediatric patients with persistent or recurrent symptoms. Need for medical consultation is also removed for administration of magnesium sulfate by paramedics treating adult patients with moderate to severe exacerbations.
- **Burns:** Palmar Method Instead of Rule of Nines: At the recommendation of the Burn Centers, the Rule of Nines was replaced with the Palmar Method as the recommended means of estimating the percentage body surface area (BSA) burned for both adult and pediatric patients.
- **Burns and Carbon Monoxide Exposure Protocols:** These changes clarify the most appropriate destination for patients with burns and/or smoke inhalation. Patients with thermal burns with or without smoke inhalation are to be triaged to a burn center rather than a hyperbaric center. Patients with smoke inhalation, but without burns, should be transported to a hyperbaric center.
- **Calcium Administration with Low Titer O+ Whole Blood Transfusions (Pilot):** This amendment calls for administration of calcium chloride in patients who receive a second unit of whole blood. The intent of this modification is to avoid hypocalcemia associated with whole blood transfusions.
- **Diltiazem:** This modification adds a precaution for use of diltiazem in patients with a history of CHF or decreased cardiac ejection fraction. Hypotension may occur rapidly following diltiazem administration in these patients and clinicians should be prepared with calcium chloride.
- **Dive Medicine (OSP):** This new Optional Supplemental Protocol is intended for use by EMS clinicians providing standby medical coverage for dive operations. It provides guidance for the evaluation and treatment of public safety divers and dive-related emergencies related to recreational and occupational dive activities.
- **Droperidol for Nausea and Vomiting:** This revision allows for administration of droperidol for treatment of nausea and vomiting. In particular, droperidol is preferred for treatment of nausea and vomiting secondary to migraines, cannabinoid hyperemesis syndrome, and cyclic vomiting syndrome. Droperidol may also be used in general cases where symptoms persist after administration of ondansetron.
- **Extraglottic Airways for Tactical EMT (OSP):** This addition to the Tactical EMS Optional Supplemental Protocol allows for use of extraglottic airways by Tactical EMTs.
- **Guidelines for Infusion Pump Settings (OSP):** This addition provides medication dosing guidelines for jurisdictions participating in the Infusion Pump OSP.
- **Ketamine for CPR-Induced Awareness:** A maximum total dose of ketamine for treatment of CPR-induced awareness was added to the ketamine pharmacology page. Up to three 1 mg/kg doses for a total of 3 mg/kg may be administered. Additional doses require medical consultation.
- **Ketamine Infusion for Ventilatory Difficulty Secondary to Bucking or Combativeness in Intubated Patients (OSP):** This modification allows administration of a ketamine infusion using an infusion pump to maintain sedation on extended transports for patients on a ventilator.
- **Language Line Recommendations:** This addition to General Patient Care reminds clinicians to utilize a translation line when a perceived language barrier is present.
- **Mobile Integrated Health Collection of Laboratory Specimens and 12-Lead Acquisition (OSP):** This addition allows an MIH paramedic to collect samples including blood draws, fecal or urinary samples, and oral or nasal swabs, as well as obtain 12-lead ECGs as a part of a regularly scheduled MIH visit. A Maryland-licensed

practitioner (MD, DO, NP, or PA) must order the lab tests and ECG and agree to review the results with the patient.

- **Needle Decompression Thoracostomy:** This modification of the NDT procedure specifies smaller catheter sizes for pediatric patients, including the use of a standard 16-gauge IV catheter for patients less than 4-years-of-age. A 3.25 inch, 14-gauge catheter continues to be recommended for patients 4-years-of-age and older.
- **Norepinephrine for Treatment of Hypotension/Shock (OSP):** This new OSP allows for use of norepinephrine for treatment of patients 18-years-old and older with sustained hypotension despite maximum fluid boluses as described in the Shock: Hypoperfusion protocol. Use of a norepinephrine infusion applies to treatment of cardiogenic, hypovolemic, septic, and neurogenic shock. Epinephrine remains the first-line vasopressor for treatment of anaphylactic shock.
- **Overdose/Poisoning:** This addition to the Clinical Pearls encourages clinicians to refer patients who are refusing transport after an overdose to available recovery resources.
- **Rocuronium for Rapid Sequence Intubation and Ventilatory Difficulty Secondary to Bucking or Combativeness (OSP):** This revision adds rocuronium as an alternative to vecuronium for use in both RSI and treatment of ventilator difficulty secondary to bucking or combativeness.
- **Specialty Care Transport/RN Changes for Interfacility Transports:** These revisions incorporate a regulatory change allowing an SCT paramedic to transport patients who are receiving a single critical care intervention. Patients receiving more than one SCT intervention still require an RN/team transport.
- **Stroke:** This modification eliminates the recommendation to administer oxygen to all pediatric patients with stroke symptoms.
- **TXA:** This change expands the use of TXA to include treatment of pediatric patients with suspected hemorrhagic shock due to trauma and women with postpartum hemorrhage.
- **Ventricular Assist Device (VAD) Protocol:** This revision expands the application of the protocol to include pediatric patients.
- **Ventricular Fibrillation and Pulseless Ventricular Tachycardia Algorithm:** Extensive modifications of the adult algorithm include the incorporation of vector change and dual sequential defibrillation for persistent VF/VT. Additional changes include limitation of epinephrine to one dose, which should be given following the initial dose of amiodarone, and the addition of esmolol for persistent VF/VT. Considerations for transport to an extracorporeal-capable destination are also included.

Regional Medical Directors

The Office of the Medical Director (OMD) coordinates a network of Regional EMS Medical Directors, who serve on the Protocol Review Committee, and for their respective regional councils. These directors act as resources for jurisdictional medical direction and lead quality improvement initiatives within their state EMS region. In collaboration with EMS Preparedness and Operations and the Office of Care Integration, the Regional EMS Medical Directors oversee the statewide EMS base station program, which offers real-time online medical consultation to Maryland's EMS clinicians.

Base Stations

An EMS base station is a critical component of emergency medical services in Maryland. Base stations provide real-time support and guidance to EMS clinicians in the field. There are 47 Maryland hospital base stations designated by the EMS Board.

Physicians and nurses who answer base station calls are required to successfully complete the MIEMSS Base Station Communications Course for Emergency Department Personnel and the 2024 Maryland EMS Updates for Hospital Base Station Personnel training video to ensure they are prepared to communicate with EMS clinicians and provide real-time medical consultation. During 2024, the base station course was offered at multiple hospitals and MIEMSS issued 487 base station certificates to emergency physicians and nurses.

EMS Medical Directors' Symposium

The 29th Annual EMS Medical Directors' Symposium was held on April 10, 2024. The symposium was attended by regional, jurisdictional, and commercial ambulance service medical directors, highest jurisdictional EMS officials, quality assurance officers, and MIEMSS personnel.

In keeping with our goal to address timely and pertinent EMS topics, this year's keynote speaker was Doug Wolfberg, JD, who presented "Managing Patients with Delirium and Agitation: Lessons Learned from the National Experience." Based upon his experience as a nationally recognized attorney with an expertise in EMS, Wolfberg conveyed valuable information and insights to attendees. Symposium presentations included:

- "MIEMSS Executive Director Updates"; Theodore R. Delbridge, MD, MPH
- "Maryland EMS Quality Improvement Initiative"; Timothy P. Chizmar, MD
- "EMS-C: Pawsitive News from Pediatrics: Assessment, Breathing Adjuncts, CPR for Children"; Jennifer Anders, MD, FAAP
- "MCAC: Current Threats and Trends"; Alex Cardella
- "Nerve Agents and CHEMPACK"; Timothy P. Chizmar, MD, and Jeffrey Huggins, NRP, CEM
- "Advanced Care Planning: Directives"; Daniel

Morhaim, MD

- "Whole Blood Updates"; Douglas Floccare, MD, MPH, and Matthew Levy, DO, MSc

Cardiac Arrest Steering Committee

The Cardiac Arrest Steering Committee (CASC), as authorized by the State EMS Board, provides guidance to MIEMSS' medical and executive leadership teams on matters related to sudden cardiac arrest in Maryland. The committee actively works on matters related to public health and safety by sharing best practices regarding: telecommunicator CPR, prehospital cardiac arrest management performance improvement, and further development of a comprehensive statewide system for the treatment of sudden cardiac arrest. In 2024, CASC introduced several new members to its roster, including emergency clinicians, 9-1-1 administrators, and pediatric champions, and empowered four subcommittees to continue the efforts to improve cardiac arrest survival through 9-1-1 and EMS synergy and community engagement.

Strengths, Weaknesses, Opportunities, and Threats Analyses (SWOT)

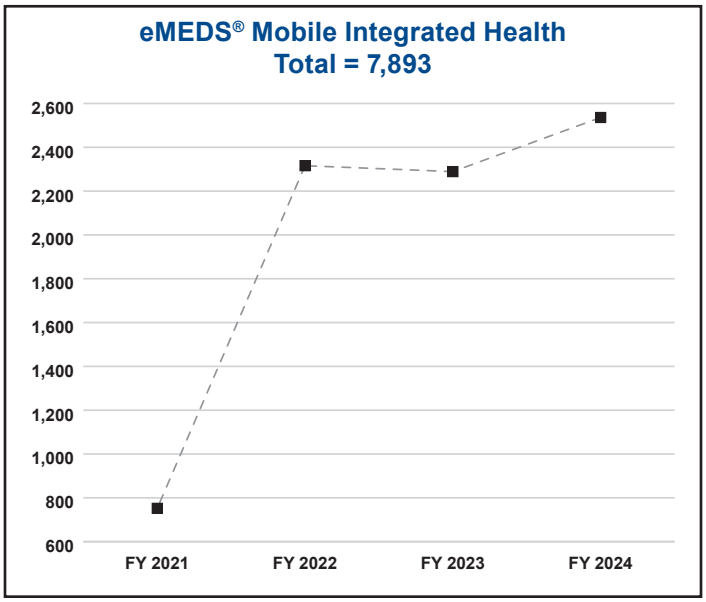
To determine future EMS needs for Wicomico County, the County Executive requested the assistance of the Office of the State EMS Medical Director and the MIEMSS Region IV Office to facilitate a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis. The analysis included input from the Wicomico County EMS Task Force, represented by Wicomico's Fire and EMS companies, Wicomico County Emergency Services (9-1-1 Center), and Wicomico County Health Department. Data-informed recommendations were prepared to identify geographical impact for preparedness. A final report will be presented to the Wicomico County Executive and Wicomico County Council in fall 2024.

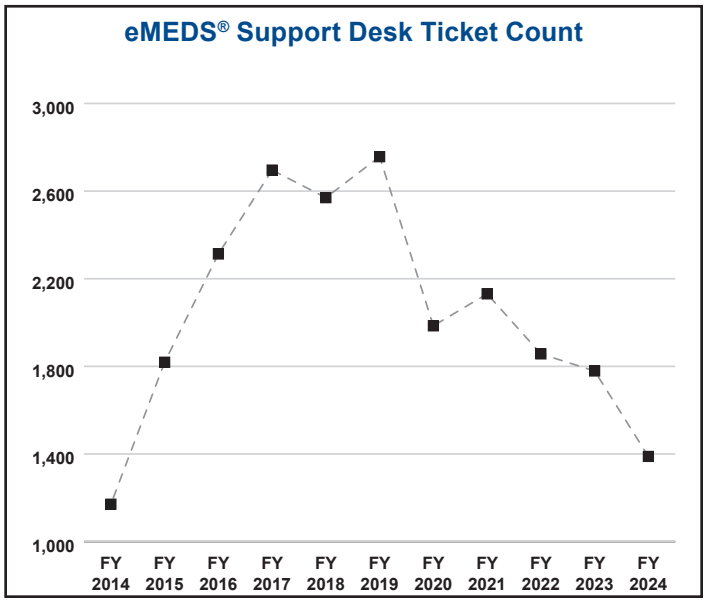
electronic Maryland EMS Data System (eMEDS®)

The electronic Maryland EMS Data System (eMEDS®) uses ImageTrend® software and complies with the latest National Emergency Medical Services Information System (NEMSIS) standards. MIEMSS holds a statewide site license for eMEDS®, offering it at no cost to local jurisdictions. All Maryland jurisdictional EMS operational programs (JEMSOPs) and some commercial ambulance services submit patient care reports directly into eMEDS®. Other commercial service reports are automatically imported from third-party electronic health platforms into eMEDS®. It is one of the few statewide comprehensive prehospital patient care reporting systems in the U.S. In addition, all Maryland healthcare facilities access these prehospital patient care reports through the Hospital Hub application.

The eMEDS® system supports several key goals, including:

- **Uniform Data Collection:** Ensures consistent reporting of prehospital care by Maryland's emergency medical clinicians.
- **Advancement of EMS Practice:** Aids in evolving EMS practices, including scope of practice, clinician roles, and destination capacity.
- **Performance Measurement:** Provides a basis for evaluating patient care and compliance with protocols by local departments, EMSOPs, regional medical directors, and MIEMSS.
- **Standardized Reporting:** Facilitates compliant data reporting to the National EMS Information System (NEMSIS).
- **Data Integration:** Supports integration with statewide systems such as ESSENCE, CRISP, ODMAP, the Maryland Trauma Registry, CARES, and MIEMSS' eLicensure System.





- **Local EMSOP Integrations:** Includes integration with 9-1-1 center CAD systems, exports to third-party billing vendors for reimbursement, and data sharing with third-party vendors for local reporting, dashboard creation, and fire incident reporting.
- **Maintaining and Updating EMS Systems:** eMEDS® was updated to version 3.5 in December 2023 to comply with the NEMSIS standards. NEMSIS is a nationwide database for prehospital EMS information and research, and is the standard for prehospital patient care reporting.

eMEDS® Mobile Integrated Health (MIH) Module

MIEMSS continues to support enhancements to the Mobile Integrated Health (MIH) module, initially developed in 2020, to improve data collection and guide future MIH efforts. As of the end of FY 2024, over 7,800 reports have been recorded using the MIH module.

eMEDS® Statewide Steering Committee

Jurisdictional, commercial, and hospital stakeholders continue to meet on a quarterly basis to discuss topics for eMEDS® improvement. Topics include system-wide integrations, enhancements, and change requests. To address continual improvement, change requests for the eMEDS® application can be submitted by any stakeholder who uses or interacts with the system. The committee reviews requests and supports actions for implementation.

eMEDS® Support Desk (emeds-support@miemss.org)

The eMEDS® application includes a MIEMSS support desk that handles requests from EMS clinicians, EMS Operational Program (EMSOP) administrators, and healthcare facility personnel across the state. Common issues include password resets, login problems, access level questions, report writer functionality, EMSOP integrations, and general application inquiries. This year, the support desk received and processed over 1,300 support tickets.

CARES Program

MIEMSS has been collaborating with the Cardiac Arrest Registry to Enhance Survival (CARES) to measure and improve cardiac arrest care in Maryland. Maryland is one of a few states that sends data from all jurisdictions to the registry. CARES is a nationwide registry for out-of-hospital cardiac arrests, designed to facilitate uniform data collection and quality improvement at the state and national levels.

A dedicated Cardiac Arrest tab in the state-wide prehospital patient care reporting system (eMEDS®) enables EMS clinicians to enter comprehensive prehospital cardiac arrest information. The cardiac arrest data set is then automatically exported to CARES; this linkage saves EMS clinicians and leadership valuable time. Maryland was one of the first states to incorporate this automated data feed between our electronic patient care reporting system and CARES. To complete the CARES record, Maryland hospital staff enter outcome data into CARES for cardiac patients who receive ongoing care in the Emergency Department.

Since January 2017, all public safety EMS jurisdictions and health care facilities in Maryland have submitted their cardiac arrest data to CARES. The Statewide data for calendars year 2017 to 2023 is now included in CARES National Reports (see tables and graphs on page 70).

During the height of the COVID pandemic in 2020, statewide out-of-hospital cardiac arrests increased to 7,850. It is significant to note, the number of cardiac arrests has returned to pre-pandemic levels. In the past year (2023), the number of out-of-hospital cardiac arrests was 6,773, which was similar to 2019, with 6,796 arrests.

Maryland CARES data confirms that early bystander CPR and use of public access AEDs significantly improves patient outcomes (see tables and graphs on page 71).

Office of EMS Clinician Services

The Office of EMS Clinician Services (OCS) coordinates Maryland's EMS educational programs and services aimed at enhancing public safety by advancing the knowledge and skills of EMS clinicians who provide prehospital emergency care. OCS verifies educational opportunities that meet requirements for licensure and certification; assists clinicians with registration, initial certification process, and license renewal; Maintains the licensure system (ImageTrend) and the Moodle Learning management system (LMS); and sells merchandise for Maryland EMS. These activities ensure that EMS clinicians receive the necessary training and support to maintain high standards of emergency care.

Maryland Clinicians

From July 1, 2023, through June 30, 2024, the Office of EMS Clinician Services issued a total of 10,368 licenses and certifications. This total includes 5,888 renewals and 1,745 initial applications. A total of 1,858 initial applications were processed, and OCS licensed:

- 162 Emergency Medical Dispatchers (EMD)
- 28 Emergency Medical Responders (EMR)
- 1,364 Emergency Medical Technicians (EMT)
- 304 Paramedics

The overall number of clinicians has remained consistent with previous years, with a slight increase this year compared to last. The largest increases were in dispatchers and paramedics, while the number of EMRs and EMTs declined slightly.

Recent attrition surveys of lapsed BLS clinicians indicated that those who did not renew their certifications were mostly volunteers who had decided not to renew. The most common reasons cited for not renewing were lack of time to volunteer or work part-time and retirement.

The number of cardiac rescue technicians (CRTs) has decreased, as MIEMSS ceased licensing new CRTs after the NREMT discontinued the Intermediate/99 certification pathway. Only current CRTs can maintain their certification, leading to a gradual decline as clinicians retire or advance to the paramedic level. A survey of ALS clinicians who recently did not renew their licenses revealed that retirement was a major reason for non-renewal, followed by relocation outside of Maryland. Most respondents were full-time employed paramedics at the time their licenses lapsed.

EMS Education Programs

The Office of EMS Clinician Services is responsible for credentialing EMS education programs approved by the EMS Board. This year, this included 17 Initial Paramedic Programs, 25 Initial EMR/EMT Programs, 39 ALS Refresher Programs, and 42 BLS Refresher Programs.

Ensuring excellence in each of the EMS education programs involves regularly reviewing curricula and course materials that ensures compliance of the national and state standards. This work includes serving on education program advisory councils, attending national accreditation visits, conducting program site visits, and ensuring that students receive high-quality EMS education through their chosen programs.

Online Training Center

The Office of EMS Clinician Services maintains the Online Training Center (OTC) to support the continuing education needs of EMS clinicians licensed in Maryland. This fiscal year, the OTC registered a total of 64,610 users, with approximately 15,912 actively using the system.

The OTC currently offers 89 active courses, including new additions like the 2024 Annual EMS Updates for all clinicians and the 2024 State Content Courses for ALS clinicians. Over the past year, the OTC also introduced a remediation course for EMT students who did not pass their first or second psychomotor exam attempts. OCS plans a minor update to the OTC in FY 2025 to further enhance its functionality for clinicians.

The Office of the State EMS Medical Director and Media Services develop educational videos for the purpose of educating Maryland clinicians on the new and updated *Maryland Medical Protocols for Emergency Medical Services*. OCS collaborates in this process by ensuring the videos are placed into modules with testing components and are SCORM-compliant. These modules and tests are delivered on the OTC.

Clinician Psychomotor Examinations

On June 30, 2024, the National Registry of EMTs discontinued the paramedic-level psychomotor examination. Prior to discontinuance, OCS conducted 14 National Registry of Emergency Medical Technicians (NREMT) paramedic psychomotor exams. Some programs opted to wait and take the new NREMT cognitive exam after July 1.

OCS scheduled 90 EMT psychomotor exam sessions for initial candidates and 59 retesting sessions in 2024 using the ImageTrend Exams module.

EMS Student Education Stipend

In 2022, MIEMSS received grant funding from the Centers for Disease Control (CDC) through the Maryland Department of Health to provide educational stipends for students entering the emergency services profession and starting their programs on or after January 1, 2022. This stipend helps to defray the costs associated with their education. Because of the positive impact of the program, it was awarded additional funds to extend the program beyond its original end date and into 2024.

The EMS Student Stipend Education Program ended on June 30, 2024. Over its duration, it provided $1,145,600 to 736 EMT students and $163,836 to 46 paramedic students, supporting their initial education and encouraging the completion of their training.

Educational Opportunities

Each year there are a number of conferences and events that give clinicians opportunities to earn education credit. Each of these opportunities requires content review and assessment for credit hours. In this reporting period, MIEMSS reviewed courses and training for hospital programs, Mid-Atlantic Transport Conference, Maryland-National Capital Region Emergency Response System Annual Symposium, Miltenberger Seminar,

Total Number of EMDs, EMRs, EMTs, CRTs, and Paramedics

[Includes Current, Extended, and Military Status; Excludes Lapsed (Inactive and Expired)]

Level	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
EMD	1,058	1,320	1,377	1,066	1,110	1,210	1,052	869	953
EMR	2,020	1,589	1,136	662	603	653	464	498	469
EMT	15,839	16,069	15,485	14,853	14,875	15,501	14,763	14,456	14,363
CRT	662	619	587	575	546	509	441	404	381
Paramedic	3,293	3,336	3,278	3,491	3,573	3,787	3,824	3,774	3,893
TOTAL	**22,872**	**22,933**	**21,863**	**20,647**	**20,707**	**21,660**	**20,544**	**20,001**	**20,059**

The State EMS Medical Directors' Symposium, and the Winterfest conference.

Affiliations

OCS represents MIEMSS as a member of the National Association of State EMS Officials (NASEMSO), Personnel Licensing Council, and Education Council and serves as liaison to Councils of the East Region to support national licensing, education, and best practices.

Office of Care Integration

The Office of Care Integration (OCI) ensures that Maryland's trauma and specialty care centers are properly designated, adhere to necessary standards, and maintain high levels of quality in patient care. OCI provides on-site verification to programs and ensures that they operate per their designation (e.g., Level I, Level II, Level III) and meet the criteria necessary to maintain their designation(s). Designation and verification processes for trauma and specialty referral centers require continuing evaluation to ensure compliance with the Code of Maryland Regulations (COMAR 30.08 et seq.,) and ensure ongoing quality assurance and monitoring of Maryland's trauma and specialty care systems. The OCI team is focused on developing strong partnerships with the centers and periodic reviews are done with a growth-oriented mindset where OCI leadership provides coaching, mentoring, and education.

Freestanding Emergency Medical Facilities

Freestanding Emergency Medical Facilities (FEMF) are licensed facilities that are structurally separate and distinct from a hospital and provides emergency care. FEMF's differ from hospitals in that they do not provide inpatient care. Freestanding Emergency Medical Facilities are required to have specific medical equipment. In FY 2024, University of Maryland Laurel Medical Center and University of Maryland Upper Chesapeake Medical Center Aberdeen were designated as Freestanding Emergency Medical Facilities.

Trauma and Specialty Centers

The Maryland trauma system is organized regionally to ensure efficient and accessible care throughout the state, and is tiered to match patients with the appropriate level of care based on injury severity. Maryland has nine designated adult trauma centers and five types of specialty referral centers: pediatric trauma, specialized adult and pediatric burn care, neurotrauma, eye care, and hand/upper extremity care. (A complete list of Maryland's trauma and specialty centers, including out-of-state hospitals with MOUs to receive Maryland trauma patients, is available on page 32.) All Trauma and specialty centers currently require redesignation within 3-5 years. All Maryland adult and pediatric trauma centers submit data to the National Trauma Data Bank (NTDB). The data is used to assist trauma centers with comparative data for benchmarking against national performance. The OCI collaborates with specialty centers in Maryland to provide a statewide quality comparison with national data.

Adult Trauma Centers

The Maryland adult trauma centers are categorized based on their level of capability and specialization (Primary Adult Resource Center, Level I, Level II, and Level III). The levels ensure that trauma care is coordinated across the state, allowing for efficient patient care and transfer of care to an appropriate facility for the severity of injuries. The network is designed to provide timely and effective treatment to improve patient outcomes. Memoranda of Understanding are in place with three out-of-state hospitals – MedStar Washington Hospital Center, Children's National Hospital, and ChristianaCare – to provide higher-level trauma services for patients closer to these facilities.

In this reporting year, OCI's trauma team had 53 visits to 16 trauma centers for planned Quartey reviews; provided consultation through two visits with Children's National Hospital Burn Center; presented 10 lectures, seven lectures in-state and three Grand Rounds at out-of-state trauma centers; and provided mentoring to five EMS agencies. In addition to serving the trauma centers, the team remains focused on staying current with best practices and educating the community through presentations and workshops at local, regional, and national conferences.

Trauma Program Improvement

The Maryland Trauma Quality Improvement Committee (TQIC) is composed of trauma program managers and directors, trauma performance-improvement staff, trauma registrars, and injury prevention and education staff. This group applies a trauma quality scorecard to review, monitor, and trend statewide compliance using metrics such as emergency department documentation of patients' Glasgow Coma Scales, emergency department documentation of patients' pain assessments, unplanned visits to the operating room, trauma bypass hours per month, and eight other criteria.

In collaboration with ESO Solutions, Inc., trauma registries for trauma, eye, and hand and upper extremity injuries have been integrated with eMEDS® patient care records to enhance the accuracy of patient information.

The Maryland Burn Collaborative analyzes burn data submissions, standard audit indicators, and performance improvement. A Maryland Burn Center scorecard tracks and trends statewide compliance using quality indicators such as the percentage of patients with a Burn Total Body Surface Area (TBSA) greater than 10% admitted within six hours of injury or interhospital transfer, and the percentage of deaths with less than 10% TBSA. The collaborative in conjunction with the State EMS Medical Director significantly influences the development of Maryland Medical Protocols for EMS, for instance, decisions on high-flow oxygen versus hyperbaric oxygen.

Stroke Core Measures (5-Year Comparison)

Core Measure	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023
Percent of ischemic stroke patients who arrive at the hospital within 2 hours of time last known well and for whom IV t-PA is initiated within 3 hours of time last known well	93.3%	92.7%	91.8%	91.2%	91.8%
Percent of patients with ischemic stroke or TIA who receive antithrombotic therapy by the end of hospital day two	98.2%	98.3%	97.7%	97.5%	97.8%
Percent of patients with an ischemic stroke, or hemorrhagic stroke, who receive VTE prophylaxis the day of or the day after hospital admission	98.0%	97.5%	97.3%	97.6%	97.7%
Percent of patients with an ischemic stroke or TIA prescribed antithrombotic therapy at discharge	99.6%	99.7%	99.4%	99.6%	99.6%
Percent of patients with an ischemic stroke or TIA with atrial fibrillation/flutter discharged on anticoagulation therapy	97.7%	98.9%	97.8%	98.5%	96.8%
Percent of patients with ischemic or hemorrhagic stroke, or TIA with a history of smoking cigarettes, who are, or whose caregivers are, given smoking cessation advice or counseling during hospital stay	99.0%	99.1%	98.6%	99.1%	99.2%
Percent of ischemic stroke or TIA patients with a cholesterol LDL level=100, or LDL not measured, or on cholesterol-reducer prior to admission who are discharged on statin medication	99.1%	99.0%	99.0%	99.3%	95.9%
Percent of stroke patients who undergo screening for dysphagia (difficulty swallowing) with an evidence-based bedside testing protocol approved by the hospital before being given any food, fluids, or medication by mouth	89.0%	91.0%	89.8%	90.0%	88.4%
Percent of patients with stroke or TIA, or their caregivers, who were given education and/or educational materials during the hospital stay addressing all of the following: personal risk factors for stroke, warning signs for stroke, activation of emergency medical system, the need for follow-up after discharge, and medications prescribed	96.9%	96.7%	96.8%	96.4%	93.2%
Percent of patients with stroke who were assessed for rehabilitation services	99.1%	99.5%	99.4%	99.6%	98.8%

Source: Get With the Guidelines-Stroke Registry

IV t-PA = Intravenous Tissue Plasminogen Activator
VTE = Venous Thromboembolism
LDL = Low Density Lipoprotein (bad cholesterol)
TIA = Transient Ischemic Attack

Designated Stroke Centers

The Office of Care Integration (OCI) strives to ensure stroke centers evolve in line with new research and best practices in stroke care. This year, the Stroke Quality Improvement Committee (Stroke QIC), consisting of Maryland hospitals' stroke program coordinators and stroke program medical directors, focused on ongoing initiatives for improving stroke care in Maryland. This work led to COMAR regulation updates for primary and comprehensive stroke center designation, and two additional stroke center designations – Acute Stroke Ready Hospital Center (ASRHC) and the Thrombectomy-Capable Primary Stroke Center (TCPSC) – were acknowledged and authorized into regulation. Two Primary Stroke Centers achieved initial designation as Thrombectomy-Capable Primary Stroke Centers and six Primary Stroke Centers renewed their designation. In total, Maryland now has 31 Primary Stroke, one Acute Stroke Ready, three Comprehensive Stroke, and four Thrombectomy-Capable Primary Stroke designated centers. This year, MedStar Franklin Square Medical Center achieved the highest level of stroke program certification and designation.

Maryland's stroke centers submit data monthly to the American Heart Association (AHA) Get with the Guidelines® stroke registry. OCI uses this data to monitor compliance with AHA and American Stroke Association (ASA) standards. By evaluating core performance measures, OCI benchmarks Maryland's compliance rates and compares them to national standards. For CY 2023, Maryland achieved a compliance rate of 92% or higher for each core performance measure, significantly surpassing the AHA/ASA minimum compliance rate of 80%. This high compliance rate reflects improved patient outcomes and demonstrates that Maryland's stroke care exceeds national benchmarks.

Maryland stroke centers use Get with the Guidelines® data to refine stroke alert protocols, enhance response times, and share best practices. This year, this data helped improve door-to-Intravenous tissue Plasminogen Activator (IV t-PA) times. Early treatment with t-PA is known to improve patient outcomes. The AHA/ASA Target Stroke Program sets a minimum standard requiring that 75% of eligible stroke patients receive t-PA within 60 minutes of arriving at the hospital. For CY 2023, Maryland's median door-to-t-PA time was 45 minutes, and 84.7% of eligible acute ischemic stroke patients received t-PA within the 60-minute standard.

During this reporting period, OCI leadership partnered with designated centers and conducted approximately 50 on-site visits to coach, mentor, and identify ways to improve and maintain stroke status and better inform the public. The stroke team regularly attends local, regional, and national conferences to gain information to disseminate best practices for stroke care in the Maryland community, and presented on learned lessons and experience at state, regional, and national conferences.

Perinatal and Neonatal Programs

The Maryland perinatal and neonatal systems follow the care standards set by the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP), which range from Level I (basic care) to Level IV (high-risk care). MIEMSS oversees Level III and IV perinatal and neonatal referral centers in Maryland. This oversight includes 15 hospitals providing obstetric services, of which 13 are Level III centers and two are Level IV centers.

Hospitals in the Maryland perinatal system submit patient care data to the Maryland Department of Health (MDH), which MIEMSS uses to refine EMS protocols and quality management. Level III and IV perinatal referral centers provide annual reports that go beyond mortality statistics, focusing on clinical excellence, patient safety, and reliability. Their goal is to eliminate preventable adverse outcomes. The data, both regional and national, helps track maternal and infant health indicators. The MIEMSS Perinatal Advisory Committee reviews this information to identify areas for improvement and establish best practices.

Maryland is currently ranked 25th in the U.S. for adverse perinatal outcomes. To address this issue and reduce preventable deaths, perinatal programs have developed EMS-specific education centered on culturally responsive care for the state's diverse maternal population. Since half of preventable maternal deaths occur after delivery and hospital discharge, MIEMSS recognizes the importance of preparing EMS clinicians in recognizing and overcoming cultural barriers to effectively communicate with all patients and provide life-saving care.

This reporting period, MIEMSS and perinatal and neonatal program leadership created and published an EMS educational video and education module (in Online Learning Center), completed 21 on-site visits to perinatal programs for the purpose of coaching, mentoring, improve patient care, and prepare centers for redesignation. Perinatal program leadership attended four conferences with national reach and presented at a regional event.

Cardiac Intervention Centers

Hospitals that meet state standards for treating ST-Elevation Myocardial Infarction (STEMI) are designated as Cardiac Intervention Centers. In Maryland, 28 hospitals and four out-of-state hospitals serving Maryland patients hold this designation. Primary percutaneous coronary intervention (pPCI) is recognized by the American College of Cardiology and the American Heart Association (AHA) as the preferred treatment for STEMI due to its association with fewer complications and better outcomes. Timely treatment to relieve the blockage improves heart muscle recovery.

All Cardiac Intervention Centers submit data quarterly to the American Heart Association's Get with the Guidelines® Coronary Artery Disease Registry. MIEMSS uses this data to evaluate and compare STEMI care in Maryland against national benchmarks. For CY 2023, Maryland achieved the target of 90 minutes or less for First Medical Contact to cardiac catheterization lab ("device") intervention in 71.7% of STEMI cases transported by EMS. All Cardiac Intervention Centers in Maryland provided primary Percutaneous Coronary Intervention (pPCI) for 93.8% of STEMI patients within 90 minutes or less.

During this reporting period, the Office of Care Integration completed 19 visits to Cardiac Intervention Centers for coaching, mentoring, improving patient care, and preparing centers for redesignation. Seventeen application and site reviews resulted in designation reports for 17 redesignations in Maryland and the renewal of our memorandum of understanding (MOU) for 4 out-of-state centers. From January to May 2024, OCI conducted a survey to identify key resources in each cardiac center across Maryland. This information allows OCI to assess resource distribution and focus on implementing cardiac quality improvement initiatives.

To enhance integration with EMS, OCI helped establish the Maryland Cardiac Center Consortium (MC3). The consortium met 5 times in 2024 and included representatives from each cardiac centers, the American Heart Association, and the Maryland Health Care Commission. MC3's primary work during this

period was preparing cardiac centers for redesignation. OCI also represents MEIMSS at the Maryland Cardiac Data Coordinators meetings to provide updates and information about the Maryland cardiac system.

EMS Preparedness and Operations

EMS Preparedness and Operations (EMSPO) provides leadership and support to the statewide EMS system by cultivating strong relationships with system stakeholders, ensuring that the system is effectively prepared and responding to the prehospital medical needs of the residents and visitors of Maryland. EMSPO includes EMRC/SYSCOM, Field Operations, Regional Coordination, the Critical Care Coordination Center (C4), and Critical Incident Stress Management.

EMRC/SYSCOM

Maryland's Emergency Medical System's communications hub is composed of two integrated components, Systems Communications (SYSCOM) and the Emergency Medical Resource Center (EMRC). Both the EMRC and SYSCOM function 24 hours a day, 365 days a year.

SYSCOM handles requests from EMS, law enforcement, homeland security, and disaster management, and coordinates helicopter resources for medevac and other missions. The Maryland State Police Aviation Command (MSPAC) Operational Control Center is located within SYSCOM, where personnel work with MSPAC Duty Officers to coordinate missions.

EMRC manages communications between prehospital Emergency Medical Services clinicians and emergency departments, trauma centers, and specialty centers to facilitate medical consultations. During major medical incidents, the EMRC shares up-to-date situational awareness regarding the activities, capabilities, and capacities of hospitals and the prehospital system. during major medical incidents, the EMRC provides initial alerting, coordinates resources, and manages patient distribution.

This year, EMRC handled 201,883 telephone and radio calls. These calls included communications involving administrative/operational support issues, single patients, incidents with multiple patients, and calls involving online medical direction. SYSCOM coordinated 4,585 total (law enforcement, search-and-rescue, medevac) flight requests, including/resulting in 1,906 patients flown to specialty referral centers. The EMRC/SYSCOM staff also monitors EMS system activity, so as to alert key MIEMSS staff of significant or extraordinary major medical incidents that may require MIEMSS support.

Emergency Medical System Situational Awareness and Operations

The EMS Preparedness and Operations (EMSPO) unit plays a vital role in Maryland's emergency management framework. They provide 24/7 staffing and collaborate with both internal and external departments and agencies to respond to incidents. Their responsibilities include data collection and system integration to support and enhance EMS operations across the state.

The EMS Preparedness and Operations (EMSPO) department coordinates and oversees:

- Management of the MIEMSS segment of the ASPR/HHS Hospital Preparedness Program (HPP) grant and funding.
- Administration of the Maryland Emergency Medical Resource Alerting Database (MEMRAD), which connects hospitals, EMS, Public Health, and other partners for a unified operating picture.
- The Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) interface, which combines EMS, hospital, primary care, Pharmacy, and other data sources data with other healthcare data for improved epidemic detection.
- The Research Interest Group (RIG), composed of MIEMSS staff, The National Study Center, and other partners that include higher education institutions publishes research and presents at conferences related to EMS and public health.
- Preparedness for the National Disaster Medical System, high-consequence infectious diseases (HCID), critical incident stress management, Chemical Emergency Prparedness (CHEMPACK) program, and healthcare facility evacuation exercises.
- Coordination of State Incident Management Team (IMT)

MIEMSS Grant Disbursements (FY 2024) by Region

	Cardiac Devices Grant for Fiscal Year 2024	ALS Training Funds	Emergency Dispatch Programs	Totals By Region
Region I	$28,930.00	$28,000.00	$0.00	$56,930.00
Region II	$59,812.00	$28,000.00	$26,501.00	$114,313.00
Region III	$130,956.00	$98,000.00	$2,500.00	$231,456.00
Region IV	$103,167.00	$67,998.00	$13,490.00	$184,655.00
Region V	$104,430.00	$78,000.00	$7,156.00	$189,586.00
Total	**$427,295.00**	**$299,998.00**	**$49,647.00**	**$776,940.00**

activities, Continuity of Operation (COOP) planning, and participation in the statewide EM conference.

- Ongoing situational awareness through communication with stakeholders and management of hospital intelligence and bed availability data.
- Facilitation of state-wide conferences, exercises and training sessions.
- Maintained ongoing situational awareness of the EMS and Healthcare systems through frequent communications with federal, state, local, and other stakeholders; EMRC reports things like mass casualty events, healthcare facility fires, and other incidents where state support or other resources is needed.
- Coordinated agency Continuity of Operation (COOP) planning.

Regional Coordination

MIEMSS Regional Offices are distributed across the state and staffed by regional coordinators and administrative personnel. Each office monitors the operation of its assigned region within the statewide EMS system. Regional coordinators serve as technical advisors to EMS jurisdictions, hospitals, and other partners, assisting with EMS system coordination and development. They collaborate with jurisdictional EMS programs to ensure that efficient and effective emergency care is always available. Additionally, regional staff support local programs, such as Mobile Integrated Health.

Critical Care Coordination Center (C4)

This year, the Critical Care Coordination Center (C4) suspended operations after 3 years and 8 months of serving Marylanders. Established during the COVID-19 pandemic, the C4 aimed to improve care for patients primarily with respiratory viruses. The C4 managed 7,000 calls for both adult and pediatric critical care patients. In 2023-24, it handled 1,312 calls, with 1,035 being adult cases. This marked a 48% decrease in pediatric calls and a 19% decrease in adult critical care calls. Over time, the C4 evolved by expanding its services to include specialty consultations for complex cases, with neurological cases seeing the most significant increase. In alignment with MIEMSS's mission and vision, the C4 developed and distributed updated guidelines for common case requests.

Critical Incident Stress Management (CISM)

Critical Incident Stress Management (CISM) provides crisis support services to EMS clinicians, firefighters, law enforcement officers, dispatchers, and other emergency personnel involved in stressful incidents. It is designed to help accelerate recovery for those experiencing severe stress reactions. CISM offers education, defusing stress, and debriefings conducted by psychosocial and EMS professionals trained in critical incident stress management. Volunteer regional coordinators serve as contacts for local 9-1-1 centers and EMRC/SYSCOM. MIEMSS collaborates closely with local CISM/peer-support teams and the International Critical Incident Stress Foundation to enhance capabilities statewide. An initial 3-day Critical Incident Stress Management course was held in 2024, this course prepares new team members to assist individuals and groups following critical incidents.

CHEMPACK

EMS Preparedness and Operations (EMSPO), in collaboration with the Office of the State EMS Medical Director, oversees the CHEMPACK program for first responders in Maryland. This program, developed by the CDC's Strategic National Stockpile (SNS), is now managed in partnership with the U.S. Department of Health and Human Services Assistant Secretary for Preparedness and Response and the Maryland Department of Health Office of Preparedness and Response. CHEMPACK provides EMS clinicians with rapid access to critical antidotes for nerve agent attacks and large-scale organophosphate poisonings. Strategically stored antidotes at secure locations across Maryland are available for quick access when needed. The CHEMPACK inventory is carefully monitored. This year, MIEMSS Regional and Emergency Operations personnel utilized the new Drop Ship Program to replace medications approaching their expiration dates.

Automated External Defibrillator Registration

Public high schools, middle schools, and county or municipality-owned or operated swimming pools are required to have AEDs, as are some public/semi-public pools and health clubs, per local ordinances. However, the voluntary Maryland Public Access Automated External Defibrillator (AED) Program permits facilities that do not provide health care but meet certain requirements to have an AED onsite for use in the event of a sudden cardiac arrest (SCA) until EMS arrives. Through the online Maryland AED registry (www.marylandaedregistry.org), MIEMSS received and approved 182 public access AED applications this year, placing 1,363 AEDs. As of June 30, 2023, 9,475 locations in the state have AEDs onsite. Registered users can receive automated notifications regarding battery and electrode expirations, program renewals, and AED recalls. The registry also integrates with AED Link, an application that displays all registered AEDs within a certain jurisdiction without having to manually enter site addresses.

The AED program has had 285 (23.1%) successful AED uses out of 1,232 reported incidents. Success is measured by the patient having a return of pulse at EMS arrival, during EMS arrival, or during EMS transport. Of the overall arrests, 667 were witnessed, and 209 of those witnessed arrests regained a pulse at the time of EMS arrival, for a 31.3% save rate for witnessed cardiac arrests.

Communications Engineering Services

Communications Engineering Services (CES) provides the equipment, support, and expertise needed to operate the statewide EMS communications systems and enhance public safety interoperability. This aligns with Vision 2030's goals of developing, sustaining, and collaborating with relevant stakeholders to advance EMS communications. CES ensures that every county and town in Maryland has a well-functioning, up-to-date, and accessible EMS communications and response system through ongoing evaluation, maintenance and improvements. CES addresses challenges by maintaining strong partnerships and effective communication with public safety organizations, including the Maryland State Police, Maryland State Highway Administration, Department of Natural Resources Police and Forestry, Maryland Department of Transportation and Transportation Authority, Maryland Department of Emergency Management, Homeland Security Border Protection, as well as 9-1-1 centers and county agencies.

Public Safety Interoperability Network (PSInet)

Communications Engineering Services (CES) deploys, administers, and maintains the Public Safety Interoperability Network (PSInet), a statewide, private IP-based public safety network consisting of fiber, microwave, and wireless links that support critical data and voice communications managed by MIEMSS. PSInet is the foundation for upgrading the EMS communications system to an IP-based system through the Communications Upgrade Project (CUP) and is crucial to MIEMSS' future operations. The network, deployed across the state, connects Maryland State Police barracks, MIEMSS regional operating centers, emergency operations centers (EOCs), public safety answering points (PSAPs), state and local health departments, hospitals, and other allied agencies. In addition to the Maryland First Responder Interoperable Radio System Team (MFiRST), PSInet supports applications such as Digital Emergency Medical Services Telephone (DEMSTEL), Central Maryland Area Radio Communications (CMARC), and systems monitoring and controlling the state's public safety microwave network and tower infrastructure.

This year, CES transitioned to new, more resilient technologies that enhance services for the EMS community. Key projects included updating Public Safety Microwave Systems, advancing the Communications Upgrade Project (CUP), addressing challenges from the Verizon copper retirement project, and continuing maintenance on communications systems. Though focused on adopting newer technologies like the Maryland First Responder Interoperable Radio System Team (MFiRST), a significant portion of the work is dedicated to maintaining and improving existing systems, giving optimal service for EMS clinicians and the public.

In partnership with the new Anne Arundel County Public Safety radio system, CES integrated into the county's Multiprotocol Label Switching (MPLS) network. This MPLS network provides redundancy to the existing MIEMSS microwave system, enhancing PSInet's resilience to outages and improving overall service quality.

The Digital Emergency Medical Telephone System (DEMSTEL) leverages the MIEMSS microwave network and PSInet to ensure interoperable communications when the public telephone switch network (PSTN) is unavailable, as well as to meet daily EMS system needs. CES is responsible for leading the design, implementation, and maintenance of the Microwave System for EMS communications in Maryland. This year, CES upgraded the core Cisco Unified Call Manager (CUCM) and replaced IP phones at 278 locations across the state. These upgrades support hospitals, MSP barracks, 9-1-1 centers, backup 9-1-1 centers, Emergency Operations Centers (EOCs), and allied agencies.

CES upgraded key microwave links to enhance the reliability and resiliency within the current communication systems plan. This included strategically placing Ethernet-capable radios in key locations to further support CUP. The upgrade of these microwave links across Maryland provides a more robust and reliable transportation of radio traffic (backhaul) that will sustain an effective EMS communications system for years to come. Since microwave systems are required for reaching remote areas, where newer systems are not currently effective, CES replaced 19 microwave links across the state to enhance connectivity for the Communication Upgrade Project.

1. Barstow to Orme
2. Parole to Sandy Point
3. Rt. 18-Sudlersville to Chestertown SHA
4. College Park to District Heights
5. Dans Rock to University of Pittsburgh Medical Center
6. Hagerstown SHA to Meritus hospital
7. Westminster MSP to Carroll Co. General
8. Stoney Forest to Upper Chesapeake Aberdeen
9. Essex Community College to Franklin Square
10. Towson Fire HQ to GBMC
11. Towson Fire HQ to St. Joseph's
12. Bressler to Harbor
13. Bressler to St Agnes
14. Bressler to Grace
15. Rt. 40 to Northwest
16. World Trade Center to Union Memorial
17. Elk Neck to Union Hospital
18. Fair Hill to Christiana
19. Oakland to Garrett Memorial

In alignment with the CUP, as older systems become more prone to failure and increased outages, work on the microwave system has provided a better infrastructure to decrease vulnerability in the communication systems. During this reporting period, Region III and V Emergency Resource Centers experienced channel outages due to failure of a critical power supplies, which are integrated into the architecture and not easily upgraded. To do this, while still focusing on completing the CUP, CES has

targeted employee training and development which will enable CESas the method to keep up with outages, reduce downtime.

Maryland First Responder Interoperable Radio System Team (MFiRST)

Communications Engineering Services (CES) serves on the Radio Control Board and Operations Committee of the Maryland First Responder Interoperable Radio System Team (MFiRST). MFiRST is a statewide system with encryption capabilities for public safety. MFiRST is designed to provide radio communication across the entire State and provides air-to-ground channels for public safety flight operations supporting the Maryland State Police medevac fleet.

The Radio Control Board manages the Statewide Public Safety Interoperability Radio System. CES's expanded interfaces enable all Maryland jurisdictions to use MFiRST for medical consultation through the Emergency Medical Resource Center (EMRC). As a result of recent funding of P25 Phase II radio upgrades for the Maryland State Police Aviation Command (MSPAC) fleet, MSPAC communications are expected to migrate completely to the MFiRST system, resulting in the retirement of the old low-band system.. MFiRST continues to address coverage gaps to improve communications. CES supports the VHF low-band system for MSPAC while promoting the use of aviation talkgroups (AVTacs) on MFiRST, creating a unified gateway for counties and aviation resources. To date, Talbot, Caroline, Carroll, Cecil, Queen Anne's, Kent, Harford, Allegany, Garrett, Dorchester, Somerset, Washington, Wicomico, and Worcester Counties are actively advancing the EMS continuum of care by implementing the AVTac. Several other Maryland counties have committed or are considering the adoption of AVTac as the MFiRST system expands and completes deployment.

Communications Systems Maintenance and Improvements

In alignment with the Communications Upgrade Plan and continual maintenance, the following accomplishments were made:

- Communications Engineering Services (CES) continually upgrades microwave power and battery systems throughout the state to ensure reliable backup power for critical systems.
- Installed IP-based communication system for Region III.
- Transitioned 24 of 28 Region III hospitals to voice-over-internet (VoIP) infrastructure to provide smoother transition to the new all-network solution.
- Established remote control and monitoring capabilities for the power systems and other system components to better respond to maintenance needs of the system.
- Hospital connectivity development in Regions I and III is continuing while core patching development for the system's reliability and functionality is tested.

Verizon Copper Retirement Program

The Verizon Copper Retirement Program, approved by Maryland Public Service Commission, discontinued several Verizon leased hospital circuits in July 2024. This forced an immediate transition to the Communication Upgrade Project's strategy. Communications Support Services (CES) implemented the connectivity strategy ahead of the region's proposed schedule and is prepared to develop solutions for any additional hospital circuits loss.

EMRC Backup Sites/Continuity of Operations

A Continuity of Operations Plan (COOP) is essential to the state-wide communications system if the Emergency Medical Resource Center (EMRC) and SYSCOM primary site is unusable. MIEMSS is in the design phase for a new EMRC and System Communication (SYSCOM) Backup Center. The backup center will be able to support current EMRC and SYSCOM operations in the event that they become unusable.

Established in a partnership with Harford County Department of Emergency Services in 2022, CES successfully installed a network virtual environment for off-site data storage, supporting advancements in EMS communications and enabling the establishment of a geo-diverse backup center separate from MIEMSS HQ. This advancement in technology is key for a stable Continuity of Operations Plan (COOP). MIEMSS continues to identify funding sources to attain equipment to advance this effort. In 2024, MIEMSS purchased some of the equipment needed through the CUP project funds for deployment in 2025. This paves the way for future completion of this critical backup center.

CES expanded its network and alarm monitoring systems to improve efficiency and expedite system repairs. The integration of MFiRST system alarms into the MIEMSS master alarm system provides daily insights into maintenance and performance issues, allowing for rapid identification and diagnosis of problems. This integration maximizes the state's investment in the master alarm system and offers a comprehensive view of MIEMSS, DNR, SHA, and MFiRST radio infrastructure. CES installed enhanced alarm monitoring at several MIEMSS tower sites and hospital locations this year.

Office of Aeromedical Director/ Aeromedical Operations

Aeromedical Operations provides the necessary physician medical support to the Maryland State Police Aviation Command (MSPAC) to meet the emergency medevac needs of Maryland's citizens. Aeromedical Operations is actively involved in ongoing training and verification of skill proficiency for Maryland State Police flight paramedics, and provides around-the-clock consultation support to Systems Communications (SYSCOM) for medevac requests and medical direction. Aeromedical staff are actively involved in the development of new patient care protocols and the oversight of ongoing care.

Transport Systems of Care

This year, the Maryland State Police Aviation Command (MSPAC) provided care to 1,982 patients. Of these patients, 1,960 (99%) were prehospital at the request of local EMS and 22 (1%) were transported between hospitals to a higher level of care. This year, MSPAC responded to 740 motor vehicle crashes, 461 falls, 71 pedestrians, 69 gunshot wounds, 61 cardiac cases, 44 stabbings, 44 assaults, 29 burns, 26 strokes, 18 drownings, and 15 industrial injuries.

Blood on Board Program

In a cooperative effort between MSPAC, MIEMSS, and the University of Maryland Medical Center (UMMC), a "Blood on Board" program was in initiated in May 2023 to better serve our most critically injured patients. All seven MSPAC helicopters carry two units of whole blood to provide service to patients in all five EMS regions across Maryland. All MSPAC flight paramedics are trained and prepared to transfuse low-titer O+ whole blood to critically injured patients in accordance with a statewide pilot medical protocol. This whole blood is intended for the treatment of patients who are in severe hemorrhagic shock, because whole blood contains all clotting factors needed to help slow bleeding and restore oxygenation to vital organs. This year, MSPAC flight paramedics provided potentially lifesaving transfusions of whole blood to 107 patients. Many of these patients showed immediate dramatic improvement while enroute to the hospital.

Rapid Sequence Intubation

Adult and pediatric Rapid Sequence Intubation (RSI) programs as defined in The Maryland Medical Protocols for Emergency Medical Services are designed to address the needs of patients whose airways are otherwise difficult to secure, including those with severe head injuries. Flight paramedics administer neuromuscular blocking medications that facilitate endotracheal intubation for patients who are not breathing adequately. Scenario-based simulation training modeled after real-life incidents enhances the knowledge and skills of flight paramedics and provides an effective method for recertification in Advanced Cardiac Life Support (ACLS), International Trauma Life Support (ITLS), and Pediatric Advanced Life Support (PALS).

Helicopter Transports

In FY 2024, the Maryland State Police Aviation Command (MSPAC) continued use of the AgustaWestland 139 (AW-139) model of aircraft for it has excellent platform for multiple missions. Equipped with the most current safety technology as recommended by the National Transportation Safety Board, the AW-139 aircraft are powerful enough to carry two patients and two EMS clinicians despite the challenging heat and humidity of the summer months. The acquisition of an FAA-certified Flight Training Device has allowed significant hours of pilot training to be conducted under simulated conditions, not only saving aircraft flight hours but also allowing the simulation of in-flight emergencies not able to be performed in an actual flying aircraft.

State Office of Commercial Ambulance Licensing and Regulation

The State Office of Commercial Ambulance Licensing and Regulation (SOCALR) provides leadership and direction to support the operations and growth of Maryland's commercial ambulance industry. It protects the health, safety, and welfare of persons using these services through the development and modification of statewide requirements for commercial ambulance services and vehicles and the uniform and equitable regulation of the commercial ambulance industry throughout Maryland.

As of June 30, 2024, 35 commercial ambulance services and 482 commercial ambulance units held licenses issued by SOCALR.

SOCALR strives for efficient and responsive leadership and coordination of EMS and medical services vehicle licensing. SOCALR began developing strategies to streamline internal business processes and implement methods to enhance records management for commercial vehicle licensing. SOCALR has updated and enhanced several of its operating systems and applications to improve productivity and reporting capabilities. This year, SOCALR rolled out the Commercial Ambulance Services Dashboard. This dashboard gives each commercial service access to all of the information that SOCALR maintains.

SOCALR continues to maintain a year-round licensure renewal schedule, inspecting all commercial ambulances at least once during the year. In addition to yearly unit renewal inspections,

State Office of Commercial Ambulance Licensing and Regular (SOCALR) Statistics

SOCALR Licensed Services	
Ground	29
Air	5
Air/Ground	1
TOTAL	**35**

SOCALR Licensed Vehicles	
Basic Life Support (BLS)	289
Advanced Life Support (ALS)	193
Air	14
TOTAL	**496**

SOCALR Total Calls	
Basic Life Support (BLS)	197,954
Advanced Life Support (ALS)	27,786
Specialty Care Transport (Paramedic)	1,992
Specialty Care Transport (RN)	11,383
TOTAL	**239,115**

SOCALR conducts random unit inspections throughout the year. This year, SOCALR conducted random inspections on 153 days, visited 1,019 sites, and inspected 147 units. Additional inspections included seven surveys of licensed commercial services bases. A team of SOCALR personnel who provide follow-up reports outlining any corrective actions necessary to maintain COMAR Title 30.09 compliance conducts these base surveys. SOCALR inspectors, in conjunction with the Office of Perinatal and Neonatal Programs, conducted seven inspections of Neonatal transport programs this year.

SOCALR works closely with commercial services and third-party electronic Patient Care Records (ePCR) vendors to ensure data is imported accurately and efficiently from the vendor platforms. This year, all commercial services transitioned to NEMSIS 3.5, National EMS Information System, to comply with federal guidelines. Patient care reports are randomly sampled for accuracy of information, and reviewed for completeness and to verify the receipt of data from services that import from third-party vendors. These measures are used to improve patient care through the standardization and aggregation of patient care data.

In May 2021, under the Governor's Emergency Declaration, SOCALR implemented a regulatory change that allowed Commercial BLS ambulances to be driven by non-EMS-licensed drivers. A waiver program was implemented to allow commercial services, who have gained approvals, to employ drivers on BLS units. Following the expiration of the emergency declaration, this program was approved by the EMS Board and adopted into COMAR. Currently, SOCALR has granted the waiver to 15 commercial services, which employ 174 approved non-EMS-licensed drivers. In Fiscal Year 2024, SOCALR worked with the commercial services to develop and propose regulations changes that expand this program to ALS units.

In FY 2024, SOCALR worked with the commercial services to develop and propose regulation changes that modernize and improve the Specialty Care Transport section. These regulation changes along with several protocol changes were implemented July 2024 and will improve the efficiency of the Specialty Care Transport programs within the State.

Office of EMS for Children

The Office of EMS for Children (EMSC) leads and coordinates resources to address the unique needs of children and families across Maryland. It focuses on injury and illness prevention, clinical protocols, standards of care, facility recognition, quality improvement, data analysis, interagency collaboration, and professional education. The goal is to enhance the efficient and effective delivery of out-of-hospital, hospital, and restorative care, promoting the health and well-being of children, youth, and families statewide.

EMS for Children coordinates state-level advisory committees, leads federal grant projects, and collaborates with state and local agencies on childhood health promotion and emergency care. EMSC provides educational resources for families in partnership with other professional organizations. EMSC coordinates Maryland's Pediatric Emergency Medical Advisory Committee (PEMAC) and its subcommittees, the State Pediatric Quality Improvement Committee (QIC), and the Pediatric Data Analysis and Research Team (DART).

Committees and Membership

PEMAC, the Pediatric QIC, and DART meet bimonthly and support the PEMAC Annual Research Forum each November. PEMAC, with its interdisciplinary membership, develops and revises guidelines, legislation, policies, and protocols affecting emergency medical care for children and youth. Current PEMAC working groups focus on the family advisory network, injury prevention, and pediatric disaster preparedness. The Pediatric QIC coordinates the online Pediatric Base Station Course for Maryland's two Pediatric Base Stations, which offer statewide pediatric medical direction and community education. Dr. Jennifer Anders, MIEMSS Associate State EMS Medical Director for Pediatrics, led the C4 for Pediatrics (C4P) clinical team over the past two years.

EMSC is an active member of the National Association of State EMS Officials (NASEMSO) Pediatric Emergency Care Council, East Region, and serves in a leadership role on the Committee for the Safe Transport of Children in Ambulances. EMSC works closely with the Maryland Emergency Nursing Association (ENA) Council and local chapters to promote pediatric education for all hospitals across Maryland and to distribute current prevention information.

Maryland EMSC State Partnership Grant

Maryland EMSC has received an EMS for Children State Partnership Grant from the Maternal and Child Health Bureau/ Health Resources Services Administration for 20 consecutive years. This funding supports the integration of pediatric readiness into hospital emergency departments and EMS across Maryland, aiming to meet federal EMS for Children Performance Measures and the Maternal Child Health Core Performance Measure. In alignment with Maryland EMS Vision 2030, the grant now focuses on Pediatric Readiness in Emergency Departments and EMS Agencies, pediatric disaster preparedness, and family advocacy to expand the Right Care When It Counts initiative. To advance pediatric readiness, the EMSC staff leads three Pediatric Champion teams: EMS, emergency department nursing, and emergency department physicians.

Pediatric Readiness in Emergency Departments – Pediatric Nurse and Physician Champions

Initiated in 2022, the Pediatric Readiness Emergency Department collaborative holds quarterly webinars for nurse and physician champions. This group includes members from the Maryland Emergency Nursing Association (ENA), the Maryland American Academy of Pediatrics (AAP), and the Maryland American College of Emergency Physicians (ACEP), along with designated

Pediatric Champions from hospitals.

This year, Pediatric Nurse Champions attended a workshop on clinical competencies for children in the emergency department and during interfacility transfers. A focus on seamless interfacility handoffs was covered in the pediatric preconference at the state ENA by the Bay conference in May. Maryland EMSC also participated in AAP and ACEP annual Maryland Chapter meetings, sharing the latest pediatric readiness publications, updates on the pediatric readiness recognition program, and pediatric references for hospital professionals.

EMSC recently completed a two-year federal rural hospital grant project that developed and piloted pediatric simulations in emergency departments, using moderate-fidelity simulation manikins and real-time patient clinical presentations. The grant team created a plan for future collaboration with pediatric specialists to standardize these simulations and extend them to community hospitals, supporting the implementation of pediatric readiness guidelines and evidence-based practices.

Prehospital Pediatric Readiness – Pediatric EMS Champions

Under the EMSC State Partnership Grant, EMSC supports the Pediatric EMS Champions within the EMS Operational Programs. These Champions, selected for their commitment to and passion for pediatric care and representation of their communities, play a key role in advancing pediatric EMS practices.

Pediatric EMS Champions promote and facilitate pediatric continuing education, support safety and prevention programs, and encourage adherence to current pediatric care guidelines. They use pediatric "Sim on the Go" simulations and training equipment to deliver education locally and enhance access to pediatric skill training and simulation experiences. This initiative aims to align Maryland with federal EMSC performance measures for pediatric readiness in EMS.

This year, the National Prehospital Pediatric Readiness Project (NPPRP) Assessment surveyed EMS agencies about pediatric capabilities. All Maryland EMS Operational Programs participated, with Pediatric EMS Champions leading the review and submission of the assessment. The aggregate data will guide the development of pediatric education, performance evaluation tools, and family-centered care guidelines.

Pediatric Education

The office of EMS for Children provides opportunities for pediatric-focused EMS and Emergency Department courses, nursing seminars, and training sessions through the continuing education and skill development conferences held across Maryland. The topics for 2024 covered pediatric burns, pediatric injuries on the Trauma Decision Tree, hyperthermia in children, safe sleep practice, pediatric trauma, and pediatric diabetes. The full-day preconference curriculum featured pediatric “Sim on the Go” scenarios, allowing EMS teams to experience both trauma and medical emergencies. These workshops included child and parent volunteers with moulage to create realistic simulations. EMSC offered the Pediatric Education for Prehospital Professionals, Fourth Edition (PEPP-4) hybrid course for ALS and BLS clinicians, both as a standalone course in Central Maryland and a course on the Lower Eastern Shore to develop a new faculty team.

Child Passenger Safety and Occupant Protection Healthcare Project

Funded by the Maryland Highway Safety Office, the Child Passenger Safety (CPS) and Occupant Protection Healthcare Project aims to reduce the number of injuries and deaths from vehicle crashes and related incidents in Maryland.

Educational efforts this year focused on car occupancy protection though consistent and proper use of seatbelts and car safety seats for passengers and caregivers. The CPS project encouraged EMS clinicians and hospital staff to become CPS Technician-certified by offering free event registrations and educational credits. The project provides car seats and specialized restraints to healthcare clinicians to support safe transport and overall community safety.

The CPS project, in conjunction with hospitals, nurseries, and NICUs, increased parents’ access to a variety of car seats for newborns and children with special needs to improve equity for those with financial need. The project provided “all-in-one” car seats to EMS agencies for transporting children in non-ambulance vehicles, when the child is not the patient.

This year, EMSC and the CPS project, in collaboration with Media Services, developed a new resource on safe ambulance transport that emphasizes the correct use of harnesses on ambulance cots. CPS project staff continued to support both community car seat check-up events and teach in the national CPS Technician course throughout Maryland. Daily outreach included advising hospital staff on safe transport of vulnerable children, conducting regional and national education programs for hospital and EMS clinicians, and distributing multilingual materials focused on safe travel for all ages and an emphasis on children.

The CPS project leads public education on the dangers of leaving children alone in vehicles. Temperature displays are used to illustrate how quickly and extreme interior temperatures of vehicles rise to, in all seasons, to convey the critical message, “Never Leave a Child Alone in a Vehicle” or “Where’s the Baby”. Six of these outdoor displays are strategically positioned in regions across the Maryland for use at community health and safety events. This work aligns with CPS’s work on the Maryland CPS board, partnering with Kids in Safety Seats, Maryland Highway Safety Office, and CPS instructors statewide.

This year, the CPS project partnered with Crash Core/Impact Research in Ellicott City, Maryland, to conduct educational workshops and on-scene crash tools development. The goal of the training is to increase EMS clinician knowledge, skills, and abilities to assess potential occupant injuries at crash scenes and plan optimal transport and treatment.

Bike Safety Project

Funded by the Maryland Department of Transportation's Maryland Highway Safety Office (MHSO), the Bike Safety Project (BSP) team coordinated bike safety marketing through new educational materials, social media communication, and dissemination of information to new and existing partners to include EMS, Fire, Rescue, and Emergency Department professionals in Maryland. This year, the project was able to distribute over 1,700 bike helmets to children, youth, and parents through local Safe Kids partners, trauma coordinators, and Pediatric EMS Champions. Over the past seven years, the project has provided more than 7,000 helmets to children and families. This year, BSP developed and disseminated media, participated in live and online programming, and conducted in-person training to promote bike safety across Maryland communities.

Safe Kids Maryland® and Maryland RISK WATCH®

Coordinated by Maryland EMSC, MIEMSS is the lead agency for the Safe Kids Maryland® state coalition. This year, Safe Kids Maryland® hosted statewide educational meetings with seven local Safe Kids coalitions and 15 community partners. EMSC, in collaboration with the Maryland State Firefighters Association (MSFA), Office of the State Fire Marshal, and the Maryland Fire and Rescue Institute, supported the Public Fire & Life Safety Educators Symposium held in March 2024.

Safe Kids Maryland® maintains membership in the Maryland division of the American Trauma Society, Maryland State Emergency Nurses Association (ENA), Partnership for a Safer Maryland, and the Maryland Trauma Center Network (TraumaNet). This year, EMSC facilitated the distribution of educational materials and resources for the Maryland Highway Safety Office grants. This effort targeted rural, suburban, and urban communities in Maryland. These efforts ensure that consistent injury prevention information is shared with MIEMSS' Regional Advisory Councils and the PEMAC.

Maryland Risk Watch®, led by EMSC and the Family Advisory Network (FAN), collaborates year-round with the Office of State Fire Marshal, the MSFA Fire Prevention and Life Safety Committee, and other significant jurisdictional partners to provide resources that promote injury prevention.

The "Steps to Safety" program provided 10 interactive displays at the MSFA Convention & Conference. These displays addressed various high-risk injuries and provided information for children, caregivers, and local injury prevention advocates, along with resources to take back to their communities. In addition, the FAN Council offered a standard babysitting course for youth at the Convention and conducted a workshop on starting similar programs at local stations or companies.

Family Advisory Network Council – Right Care When It Counts

Maryland EMSC and the FAN Council annually recognize children and youth in Maryland who have demonstrated "the right steps to take" in an emergency or preparedness for an emergency. In May, five children and youth were recognized for their actions to assist another citizen during an emergency or to provide education to other children and youth on what to do when an emergency happens. This year, the Right Care When It Count awards were presented in Regions III and V to children and youth for calling 9-1-1 and providing care until paramedics arrived and for teaching other youth about the importance of knowing how to access emergency care and how to perform CPR.

Data Analysis and Information Management

Quality Management

Data Analysis and Information Management (DAIM) drives continuous quality improvement initiatives, fosters a customer-focused approach, and enhances the capacity for impactful advancements in related fields.

EMS Surveillance Measures

MIEMSS prioritizes several EMS system surveillance areas, guided by routine data review, customer requests, and research outcomes. Key initiatives include:

- **County Hospital Alert Tracking System (CHATS):** Monitors hospital emergency department alerts at state, regional, jurisdictional, and hospital-specific levels, providing real-time data and historical trends to improve emergency department service availability and integrate with the Maryland Department of Health's (MDH) syndromic surveillance programs.
- **Helicopter Utilization Database (HUD):** Tracks all helicopter transport requests, regardless of the outcome, allowing EMS managers and medical directors to review cases and ensure aeromedical transport is reserved for the most severe, time-critical incidents.
- **Naloxone Administration Data:** Ongoing since 2017, records of EMS interventions involving naloxone for opioid overdoses are collected and shared with MDH and Maryland's Office of Overdose Response. This data, combined with other resources, aids in monitoring opioid overdose trends and developing strategies to combat the crisis.

Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) and eMEDS® Integration Project

MIEMSS' Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) interface links EMS patient encounter data with other statewide healthcare data shared with ESSENCE. This combination of EMS, Hospital, Primary Care, Pharmacy, and other data sources give public health partners enhanced situational awareness for potential disease outbreaks and epidemics.

Data Confidentiality

MIEMSS maintains or has access to eight confidential databases to ensure quality EMS care delivery. The Data Access Committee oversees these databases to process data requests efficiently while maintaining patient and clinician confidentiality. Since January 2000, MIEMSS has managed over 3,500 data requests. During this reporting period, July 1, 2023 – June 30, 2024 there were approximately 360 data requests.

MD EMS Statistics from (eMEDS®)

The electronic Maryland EMS Data System (eMEDS®) is a key resource for querying data on EMS demand, response, and outcomes. All jurisdictional EMS Operational Programs (EMSOPs) in Maryland use eMEDS® to document call information, either through local devices with internet access or a dedicated website.

Maryland Emergency Medical Resource and Alerting Database (MEMRAD)-NG

The Maryland Emergency Medical Resource Alerting Database (MEMRAD) is the statewide system for health, medical alerting, and resource tracking in Maryland. Administered by MIEMSS, it facilitates real-time information sharing among hospitals, EMS, Public Health, and Emergency Management. MIEMSS is in process of upgrading MEMRAD to MEMRAD-NG (Next Generation), which will feature enhanced interoperability, mobile applications, and improved redundancy.

@Hospital Ambulances (@HA)

The At Hospital Ambulances (@HA) app is a web-based tool developed by Data Analysis and Information Management (DAIM) to track ambulance activity at Maryland hospitals. Accessible via desktop and mobile devices (iOS, Android, Windows), the app provides information on ambulance units at hospitals, including hospital name, number of units, alert status, and length of stay. Data is sourced from EMSOPs' Computer Aided Dispatch (CAD) Systems and is available through a link in the eMEDS® patient care reporting system dashboard. It can also be viewed with limited details at https://aha.miemss.org. Jurisdictional EMS administrators can log in to access detailed information, including unit numbers and jurisdictions. A new version of the @HA app, which will include information on ambulances enroute to hospitals, is expected to be released in fall 2024.

Online Training Center: A Commitment to Digital Learning Excellence

Last year, MIEMSS upgraded the Online Training Center (OTC), emphasizing improved usability and a modern design. This advancement and maintenance align with MIEMSS mission to be integrated and seamless and provide for continuing education opportunities for Maryland EMS clinicians. MIEMSS Online Training Center seamlessly integrates with the MIEMSS Licensure System. DAIM has planned regular updates for system integration and usability for FY 2025.

Chesapeake Regional Information System for our Patients (CRISP) and eMEDS® Integration Project

The integration of eMEDS® with the Chesapeake Regional Information System for our Patients (CRISP), is a key ongoing project. Data Analysis and Information Management (DAIM) has enhanced this integration to enable CRISP to receive additional patient care data more frequently. EMS reports are now securely transferred to CRISP in near real time, making these reports accessible to all healthcare clinicians with CRISP access, including primary care providers. This alignment ensures that prehospital emergency care information is available to participating physicians and hospitals statewide. A planned phase of the project aims to provide EMS clinicians with select patient medical data, such as medical history and medications, to further improve care at the patient's side.

Enhancing Data Analysis for Improved Patient Care

This year, MIEMSS improved its data analysis capabilities by using local eMEDS® and Licensure System databases to enhance the quality of prehospital care and ensure better patient outcomes. This enhancement focuses on:

- **Detailed Reporting:** Generating accurate and timely reports to track and understand prehospital care trends.
- **Key Metrics:** Identifying important measures to drive improvements across the system.
- **Effective Data Use:** Combining EMS and hospital data to get a complete view of patient care and find ways to improve coordination and efficiency.

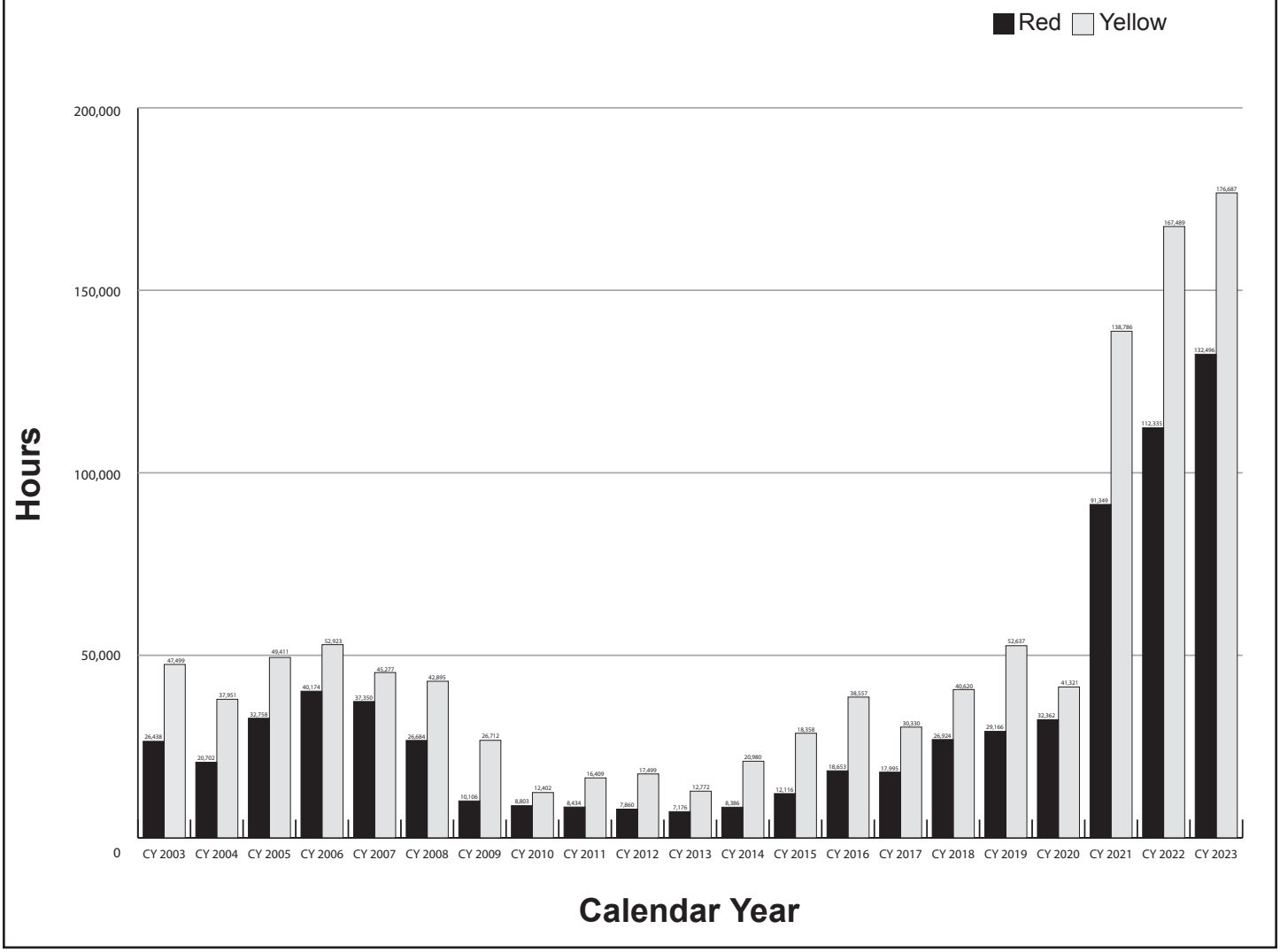
Opioid Overdose Data Reporting

In accordance state regulations, MIEMSS continues to contributes data from EMS patient care reports to the Washington/Baltimore High-Intensity Drug Trafficking Areas (HIDTA) Overdose Map (ODMAP) database. MIEMSS works closely with the Maryland Department of Health, the Maryland Office of Overdose Response, and other partners that monitor and tackle opioid overdoses across Maryland. This collaborative effort is dedicated to providing comprehensive oversight and a proactive response to the opioid crisis in the state.

EMS Portal

Data Analysis and Information Management works with the Office of EMS Clinician Services to maintain the EMS Portal. This platform enables local jurisdictions to create and use customized educational reports. The initiative helps jurisdictions better understand and address the specific training needs of their clinicians.

State Diversion Alert Totals (Calendar Years 2003 to 2023)



Information Technology and Systems Management

The Office of Information Technology and Systems Management (MIEMSS IT) works to improve Maryland EMS by providing leadership, support, and guidance in their use of information technology and systems management.

MIEMSS IT works with all of the MIEMSS Offices and Departments to provide hardware, software, technology integration, evaluation, and support, including networking and security. The following are a selection of the important systems that require collaboration with MIEMSS IT:

- **electronic Maryland EMS Data System (eMEDS®):** supports the management of the eMEDS® system, which is used by Maryland's EMS operational programs (EMSOP) and most licensed commercial ambulance services to submit patient care reports.
- **National Study Center Collaboration:** collaborates with the National Study Center for Trauma and Emergency Medical Systems (NSC) to advance the use of EMS data. Continuing collaboration includes working on Crash Outcome Data for Enhancing Survival (CODES) project and the EMS Research Interest Group (RIG).
- **Online Training Center:** MIEMSS regularly updates its Online Training Center (OTC) to enhance usability and design in its continual efforts to provide continuing education opportunities for Maryland's EMS clinicians. Based on Moodle (a free, an open-source Learning Management System), the OTC is integrated with the MIEMSS Licensure System.

- **MIEMSS Licensing:** provides infrastructure support for this system, which serves as a one-stop resource for all licensed clinicians in the State of Maryland.
- **At Hospitals and Ambulances (@HA):** provides ongoing support for this system, which tracks wait time and number of Maryland EMS units at various medical facilities in and around the State of Maryland.
- **County-Hospital Alert Tracking System/County-Hospital Request System (CHATS/CHRS):** provides ongoing technical support for these two systems, which enable medical facilities in and around the State of Maryland to request/report/display their alert status in real-time while also providing a wide variety of reporting capabilities for legacy alert statistics.
- **Emergency Department Advisory System (EDAS):** MIEMSS IT has provided full infrastructure design and build support for the underlying platform that will be hosting this successor to the CHATS/CHRS system.
- **Maryland Perinatal Dataset Portal:** MIEMSS IT provides ongoing infrastructure support for this statewide perinatal resource center.
- **Maryland Hospital Designation Application Center (MHDAC):** MIEMSS IT redesigned and implemented an upgraded replacement for this system that allows Maryland medical facilities to submit applications for inspection and designation.

Remote Access and Teleworking

MIEMSS IT continues to support remote and telework options for administration and staff in alignment with Maryland's teleworking policy. This year, it enhanced VPN security and capability by upgrading to a new VPN client platform, refining multi-factor authentication, and introducing real-time authentication monitoring.

Flight Vector

MIEMSS hosts and maintains Flight Vector, the computer-aided dispatch system used by the Maryland State Police Aviation Command (MSPAC) and MIEMSS. This system streamlines the request, selection, assignment, and tracking of aircraft for medevac operations in Maryland. It speeds up the dispatch process and enhances flight safety by providing real-time, automated tracking of MSPAC aircraft. Flight Vector also automates the tracking of Emergency Medical Resource Center (EMRC) consultations and includes a disaster recovery instance at a separate data center.

This year, MIEMSS IT, in collaboration with MSPAC and Flight Vector staff, upgraded Flight Vector to the latest server and client versions across all MSPAC sites and affiliated locations. All on-site and off-site Flight Vector servers were standardized to prepare for a new production failover configuration. Work with MSPAC and Flight Vector staff to further customize the software to meet specific site needs is ongoing.

Trauma and Specialty Care Registries

MIEMSS hosts the Maryland Adult and Pediatric Trauma, Hand, Eye, and Burn Registries, and partners with Electronic Health Records for Emergency Services (ESO) to maintain critical support for these systems. This year, MIEMSS IT achieved the following:

- Upgraded the Linux-based operating system and database software for the Gen 6 platform.
- Collaborated with ESO to enhance platform functionality, stability, and security, and addressed critical user support issues.
- Identified (with ESO) solutions to issues in the Maryland Registries that were subsequently implemented in other registry systems nationwide.
- Investigated and developed strategies to improve system enhancement and integrity.

The Emergency Medical Resource Center and System Communications EMRC/SYSCOM Support

This year, MIEMSS IT provided 24/7 technical support to EMRC/SYSCOM in coordination with Communications Engineering Services to achieve the following:

- Collaborated to further refine procedures for updating EMRC/SYSCOM IT equipment with the latest security patches and operational software in both main and backup centers as needed without downtime or interference to critical EMRC or helicopter mission tasks.
- Initiated planning to establish a presence in the new EMRC/SYSCOM Backup Center at the Harford County 9-1-1 Communications Center.
- Refreshed computing equipment in the existing Backup Center.

EMS Audio Recording (EMSAR) System

The EMSAR system provides connectivity to the MIEMSS NICE Audio Recorder system for hospitals to review consultations for quality assurance needs. MIEMSS IT continues to support Communications Engineering Services to provide secure internet access for hospitals to retrieve EMS/hospital consultation recordings. This is necessary for completing the EMS Communications Upgrade Project and the Verizon copper circuit retirement. This year, MIEMSS IT initiated a refresh of critical components to increase system performance and security. The EMSAR refresh is scheduled to be completed in mid-2024.

Help Desk and User Support

MIEMSS IT is committed to providing support to end users, including agency staff and EMS clinicians statewide. It hosts a help desk ticketing system (KACE), which contains queues supporting a number of MIEMSS departments, including Computer Support, eMEDS®, Licensure, MEMRAD, C4, Infectious

Diseases, and Media Services and Public Information. This system supports ticketing through incoming phone calls, emails, and from the KACE web application. Dedicated, skilled staff monitor these queues, and tickets are investigated, assigned, resolved, completed, and closed. These tickets are archived and stored for assessment and improvement. The eMEDS® and Licensure queues are two of the primary public-facing ticketing systems. Each ticketing system receives assistance requests from EMS clinicians and EMS Operational Program (EMSOP) administrators throughout the state for issues like password resets and login concerns, access questions, report writer functionality, and other eMEDS®/ Licensure-related issues. Additionally, the Computer Support queue receives requests for general IT-related issues (including password and login issues, VPN, email, website and application outages, and general hardware/software/network support). The Licensure support queue received 4,904 tickets that were created and resolved in CY 2023, while the eMEDS® support queue processed 1,628 tickets during that same period. The Computer Support queue received and resolved 1,318 requests in CY 2023.

MIEMSS IT has also begun to implement a resource deployment tool that will allow for the rapid imaging and deployment of computing resources to our internal users. This tool is scheduled to be fully online by Q4 2024.

Security Improvements

Information Security monitors MIEMSS IT operations for potential exploits, vulnerabilities, and threats and makes proactive enhancements to MIEMSS IT infrastructure and related systems. Security awareness training is a focal point, ensuring that staff are aware of common security threats and take necessary action. MIEMSS proactively monitors emerging threats and gathers threat intelligence from government and industry sources. MIEMSS applies critical security patches to the IT infrastructure and related systems in a timely fashion to protect against emerging cyber security threats and vulnerabilities. Information Security and MIEMSS IT personnel work collaboratively to expand and develop system security plans, as well as codify managerial, operational, and technical security controls. This year, those efforts included software updates to internal firewalls, network, email, and endpoint protection suites; a full assessment and periodic monitoring of all front-facing websites for security strengthening; enhanced access controls on the network frontend; upgrades to physical security systems; and the installation/configuration of new network scanning tools.

MIEMSS IT continued to deploy and refine security software tools, including industry-standard vulnerability scanning software and log management/security information and event management software. These tools enable MIEMSS to rapidly identify and remediate security issues, track and identify anomalous network behavior, and ensure MIEMSS information systems remain safe, stable, and operational to provide critical services and information to clinicians. MIEMSS continued to see benefit in the detection and blocking of malicious access attempts, doubling the efficacy of the prior year's efforts. The physical security of IT resources is a high priority. MIEMSS IT installed new hardware to upgrade the MIEMSS physical access control system. This upgrade, along with an additional upgrade of the security camera infrastructure at MIEMSS headquarters, is scheduled to occur in early-FY 2025. This upgrade will further improve the reliability and performance of this system and enhance MIEMSS IT ability to monitor the physical security of its headquarters building.

Information Security is currently reviewing the MIEMSS core IT policy framework in order to revise existing policies while working to develop a new policy foundation.

Computer Network Improvements

MIEMSS IT works to continually improve computer resources, network reliability, and disaster preparedness by upgrading core server, storage, and VMware® systems. It expanded resources to include additional storage and server hardware. These resources permit MIEMSS to expand the capacity of the production infrastructure allowing continued growth of the virtual server environment and to decommission end-of-life technology. This year, MIEMSS IT accomplished these milestones:

- **Production Systems Infrastructure:** Finished integrating new production storage and virtual machine (VM) infrastructure equipment into the core network, as well as the full upgrade of the MIEMSS VM production platform to the latest version and the decommissioning of all production legacy storage/compute equipment. This completes the full refresh of production assets and offers the flexibility to utilize existing equipment in other initiatives, such as the expansion of disaster recovery capabilities.
- **Server Infrastructure:** A complete software refresh on all production servers has upgraded the servers to the latest version of the operating system and other critical production software.
- **Monitoring/Alerting:** Has implemented new servers to host updated network components and provide enhanced continuity of operations, mapping, and monitoring capabilities.
- **MIEMSS Email (Exchange):** Completed the upgrade of the MIEMSS internal email system to the latest version of Microsoft Exchange in accordance with best practice guidelines.
- **Regional Offices:** Deployed additional new networking infrastructure and equipment to enhance network performance and reliability at Regional Office sites on the Eastern Shore, Western Maryland, and the National Capital Region, and more closely aligning them to the core network. This included implementing new video conferencing systems and infrastructure, operational in three of the four regional offices. This project is planned for

completion in mid-2024.

- **Disaster Recovery:** Began site evaluation for a new disaster recovery center.

MIEMSS Website Redesign

The MIEMSS website redesign was supported through collaborative efforts between MIEMSS IT and Media Services, where a secure and effective development environment was created and the web servers were updated to current systems for website deployment.

Media Services and Public Information

Media Services and Public Information (Media Services) at MIEMSS is responsible for a wide range of tasks essential to communication and outreach to the EMS community. This includes designing, developing, and maintaining the MIEMSS website, creating educational and instructional media for EMS educators and clinicians, producing publications, videos and presentations, and providing audio/visual support for conferences. Media Services handles graphic and illustrative design, visual communications such as public service announcements, newsletters, social media content, and web materials. Media Services and Public Information handles public information requests mandated by Maryland's Public Information Act, ensuring transparency and accessibility to information.

Maryland Medical Protocols for EMS

A crucial role within the EMS System is the continual production of instructional and demonstrative videos for *The Maryland Medical Protocols for Emergency Medical Services*. Media Services collaborates closely with the Office of the Medical Director to develop and record these productions. This involves capturing Maryland EMS professionals in action, demonstrating new processes and procedures. Media Services is responsible for designing and editing content with a focus on meeting the needs for a variety of learning preferences. Media Services finalizes and prepares media for public viewing and ensures compatibility with Clinician Services' SCORM requirements for publication on the Online Training Center. This allows clinicians to access the videos for educational credit and enhancing ongoing professional development within Maryland's EMS community.

Multimedia Innovation

This year, Media Services made significant strides leveraging technology to enhance aspects of its operations. Media Services successfully supported the update of web servers, leading to improved performance and reliability to support essential web-based products. This made it possible to implement the redesign and restructuring of the MIEMSS website, making it more user-friendly and accessible for EMS stakeholders. As part of its commitment to maintaining historical content, Media Services developed and released the Maryland EMS History Timeline, archiving the evolution of MIEMSS and the Maryland EMS system over the years. With excitement and enthusiasm, Media Services launched the first version of The Maryland Medical Protocols for Emergency Medical Services App, available on both iOS and Android platforms. This mobile application is designed to provide EMS professionals with quick access to critical protocols and guidelines, geared toward improving efficiency and effectiveness in emergency response across Maryland. These advancements underscore MIEMSS' dedication to innovation and excellence in supporting the EMS community and fulfilling our mission to provide effective care to patients by reducing preventable deaths, disability, and discomfort. Media Services keenly anticipates growth and the expansion of features in its products.

Continuing to leverage technology, Media Services is committed to reducing its environmental footprint while increasing access to content. This year, Media Services transitioned its monthly newsletter, Maryland EMS News, to a fully online platform, with a printable version available on demand. This move to e-publications aligns with Media Services' goal to enhance accessibility while promoting sustainability. This practice will move Media Services forward in creating e-publications for MIEMSS' Annual Report and the Maryland EMS Protocols, effectively reducing the number of printed copies. This year, Media Services reduced the number of printed Annual Reports from 500 to 300, and eliminated the printing of Pocket Protocol Books entirely, down from 20,000 copies. Further leveraging technology, MIEMSS' social media strives to effectively communicate and share information through various means such as job and educational opportunity announcements, conference and event advertisements, live interviews, preventative medicine, video PSAs, and direct access to website content. These platforms foster best communication practices and facilitate the dissemination of information, resulting in various levels of EMS community connectiveness. MIEMSS regularly engages in social media using Facebook, Instagram, LinkedIn, and X.

Events and Conferencing

Media Services strives to support MIEMSS' internal events as well as those organized by its partners. This year, the Media Services team:

- Supported the training and development for the **Blood on Board** project and organized its informational Media Release with Maryland State Police and the University of Maryland Medical Center.
- Collaborated with MIEMSS leadership to plan and execute several key events, including:
    - Mid-Atlantic Life Safety Conference
    - Winterfest EMS Conference
    - Miltenberger Emergency Services Seminar
    - Maryland EMS Medical Directors Symposium
    - Point Counterpoint Conference

- Maryland Stars of Life and Right Care When it Counts Awards
- Maryland Emergency Management Association Symposium
- Maryland Fire and Rescue Services Memorial
- Maryland State Firefighters Association Convention & Conference

- Media Services provides a variety of support to ensure the success of each event, including:
  - **Organizational Planning and Marketing:** Developing strategies and promotional materials to ensure successful event execution.
  - **Social Media Interviews and Marketing:** Managing social media campaigns to promote events and engage with audiences.
  - **Printed Posters and Programs:** Designing and producing printed materials for event promotion and information.
  - **Photography and Video:** Capturing key moments through professional photography and video production.
  - **Audio/Visual and Presentation Support:** Providing technical support for presentations, including sound, lighting, and projection.

Through these efforts, Media Services ensures event success and assists and sustains important initiatives.

Office of Integrity

The Office of Integrity works to ensure the health, safety, and welfare of the public as it relates to the delivery of EMS by Maryland-licensed and certified EMS clinicians. It helps to ensure the quality of patient care by investigating complaints and allegations of prohibited conduct as defined by COMAR Title 30.02.04.01.

The Office of Integrity works closely with the EMS Board, Attorney General's Office, Incident Review Committee (IRC), Peer-Review Panel (PRP), and EMS operational program (EMSOP) quality assurance officers statewide. The PRP is a 13-member panel of all levels of EMS clinicians. The PRP reviews complaints, as well as the results of the investigations presented by the Office of Integrity, and recommends corrective and disciplinary actions to the EMS Board. The State EMS Medical Director and MIEMSS Executive Director serve as ex-officio members of the PRP.

Office of Integrity Activity

- Provisional applicant background investigations completed (0)
- Stipend applicant background investigations completed (41)
- Initial and renewal background investigations completed (10,632)
- Reciprocity background investigations completed (328)
- Total background investigations completed (10,960)
- IRC investigations conducted (85)
- IRC Complaints Issued (65)
- IRC complaints forwarded to PRP (61)
- Complaints forwarded to EMS Board (61)

EMS Board Actions

- Reprimands (13)
- Probation (43)
- Suspensions (7)
- Revocations (3)
- Remedial training (4)
- Surrenders (3)
- Applications denied (0)
- Random testing (6)
- Case Resolution Conferences (15)
- OAH hearings conducted (4)
- OAH hearings defaulted (0)
- Settlement agreements (11)

Administration

Administration is responsible for the accounting, procurement, grant administration, and human resources functions of MIEMSS.

The Accounting Unit provides oversight and guidance for human resources and the management of various fiscal and budgetary matters. The staff develops the budget, tracks and monitors expenditures, processes accounts payable and receivable, maintains employee leave and payroll records, and deposits cash receipts.

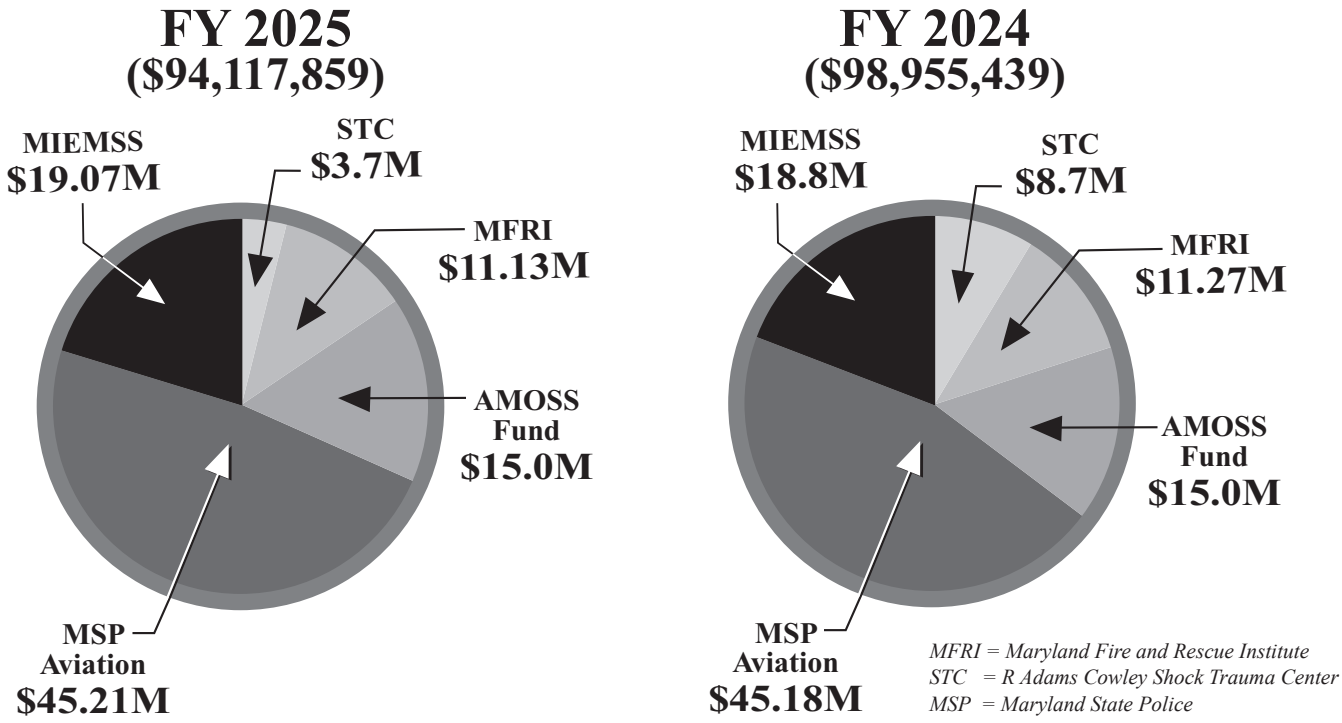
The Procurement Unit obtains all necessary supplies, materials, and services required by MIEMSS to fulfill its mission in accordance with all applicable state procurement laws and regulations. The Procurement Unit is responsible for contract and grant administration.

Administration's other responsibilities include inventory control, fleet management, travel services, and building operations and maintenance. In addition, Administration supports legislative and regulatory initiatives and provides financial data relevant to the legislative actions that support the Maryland Emergency Medical Services Operations Fund.

Attorney General's Office

The Attorney General's Office (OAG) provides legal advice to the EMS Board, the Statewide EMS Advisory Council, and MIEMSS in connection with all aspects of EMS, the ongoing administrative functions of the agency, and the regulation of

EMS Operations Fund



commercial ambulance services. OAG supports MIEMSS in promulgating and implementing the agency's regulations, procurement, personnel matters, and contracts, including technology initiatives, as well by assisting in the administration of state and federal grant programs.

OAG helps to ensure the safety and reliability of the Maryland EMS system by advising the MIEMSS Office of Integrity on matters concerning EMS clinician compliance and prohibited conduct. It also serves as the administrative prosecutor for cases involving allegations of prohibited acts by EMS clinicians before the EMS Provider Review Panel, the EMS Board, the Office of Administrative Hearings, and the courts. This year, it handled 85 new cases of alleged prohibited acts by EMS clinicians and applicants.

OAG provided legal advice to the State Office of Commercial Ambulance Licensing and Regulation (SOCALR) in compliance matters and questions of regulatory interpretation, and provided support to the Commercial Ambulance Services Advisory Committee. Assistant attorneys general helped the Office of Care Integration to monitor compliance requirements of specialty referral centers. This year, they worked to amend regulations, to expand access to care in Maryland including updating the staffing standards specialty care transport for SOCALR and establishing a way for EMS Operational Programs to facilitate telemedicine appointments for low-acuity patients under certain circumstances. OAG advised the Office of EMS Clinician Services on the application of requirements for licensure and certification, as well as the development of regulatory amendments to update those requirements; provided advice and support for the designation of trauma and specialty referral centers and base stations; prepared responses to Public Information Act requests and subpoenas; responded to requests for Data Access and facilitated MIEMSS's participation in research projects; and provided advice on the Maryland Public Access Defibrillation program and the AED Registry.

Maryland Orders for Life-Sustaining Treatment (MOLST) provides patients with the legal means for communicating medical care wishes to EMS and other health care professionals. This year, OAG helped to distribute plastic bracelets and answered inquiries to assist the public to better understand the MOLST program. The public can download the MOLST form from the MIEMSS website, and MIEMSS provides hard copies for those individuals without internet access. OAG provides information to EMS clinicians by answering questions and aiding in MOLST implementation.

Office of Government Affairs

The Office of Government Affairs (Government Affairs) is dedicated to advancing EMS by cultivating collaborative partnerships between relevant constituents and State government. As MIEMSS' liaison with the Executive and Legislative branches, Government Affairs helps to develop effective statutory and

regulatory approaches and solutions to a variety of prehospital emergency and health care issues. It works on proposed legislation that affects all components of the statewide EMS system, as a whole. By partnering with EMS clinicians, physicians, nurses, hospitals, and other health care providers, Government Affairs ensures that EMS system issues are accounted for in legislation under consideration by the Maryland General Assembly.

The 2024 Legislative Session saw the passage of several bills to address the financial needs of Maryland's EMS System and to increase financial support of our trauma centers and physicians. The vehicle registration fee surcharge, which supports key system components through the EMS Operations Fund, was increased to ensure the solvency of the EMS system for the foreseeable future. The use of the surcharge was also expanded to provide support to the R Adams Cowley Shock Trauma Center and to expand the Maryland Trauma Physician Services Fund to address support the state's trauma centers and trauma practitioners.

The ability of all qualified individuals to apply for EMS/licensure in Maryland was secured with the passage of legislation that enables applicants to prove lawful presence in the U.S. through alternative documentation other than a Social Security or tax ID number. This is especially important as Maryland's Fire and EMS services seek to ensure the availability of skilled personnel to respond to emergency calls.

New legislation ensured the ability of paramedics to continue to administer flu and COVID-19 immunizations as part of public health outreach efforts conducted by local health departments or hospitals/hospital systems for the next several years.

MIEMSS' Public Access Automated External Defibrillator (PAD) Program was expanded to require public buildings that participate in the PAD program to co-locate up to two doses of naloxone with the AED. Funds from the Opioid Restitution Fund are to be used to fund the naloxone co-location initiative.

The 9-1-1 Trust Fund was expanded to permit the Trust Fund to be used to provide funding for the costs of telecommunications CPR training. In addition, a 9-1-1 Specialist Recruitment and Retention Workgroup was established to examine and make recommendations to improve recruitment and retention for 9-1-1 specialists.

Each public middle and high school must update, and all nonpublic middle and high schools must develop, venue-specific emergency action plans that include a cardiac emergency response plan for athletic facilities. The plan must identify a cardiac emergency response team comprised of appropriate school personnel to respond to sudden cardiac arrests or similar life-threatening emergencies; include certain "core" elements, e.g., requiring training in CPR and AED use; and coordinate with local EMS. A grant program was also established for local school systems to improve emergency notification systems and communications between school personnel, the local Public Safety Answering Point, and public safety agency during emergency events.

MARYLAND TRAUMA AND SPECIALTY REFERRAL CENTERS

MARYLAND DESIGNATED TRAUMA CENTERS
(For explanation of differences in levels, see Trauma Center Categorization chart on page 33)

Primary Adult Resource Center
- R Adams Cowley Shock Trauma Center/University of Maryland Medical Center

Level I Adult Trauma Center
- The Johns Hopkins Hospital

Level II Adult Trauma Centers
- Johns Hopkins Bayview Medical Center
- Sinai Hospital
- Suburban Hospital–Johns Hopkins Medicine (JHM)
- University of Maryland Capital Region Medical Center

Level III Adult Trauma Centers
- Meritus Medical Center
- TidalHealth Peninsula Regional
- UPMC Western Maryland

Pediatric Trauma Center
- Johns Hopkins Children's Center

Out-of-State Hospitals (with MOUs)
- Adult: ChristianaCare Health System
- Adult: MedStar Washington Hospital Center
- Pediatric: Children's National Hospital

MARYLAND DESIGNATED SPECIALTY REFERRAL CENTERS

Cardiac Interventional Centers
- Region I
  - » UPMC Western Maryland
- Region II
  - » Frederick Health
  - » Meritus Medical Center
- Region III
  - » Anne Arundel Medical Center
  - » Carroll Hospital Center
  - » Howard County General Hospital, JHM
  - » Johns Hopkins Bayview Medical Center
  - » The Johns Hopkins Hospital
  - » MedStar Franklin Square Medical Center
  - » MedStar Union Memorial Hospital
  - » Sinai Hospital
  - » St. Agnes Hospital
  - » University of Maryland (UM) Medical Center
  - » UM Baltimore Washington Medical Center
  - » UM St. Joseph Medical Center
  - » UM Upper Chesapeake Medical Center
- Region IV
  - » TidalHealth Peninsula Regional
  - » University of Maryland Shore Health at Easton
- Region V
  - » Adventist HealthCare White Oak Medical Center
  - » Holy Cross Hospital
  - » MedStar Southern Maryland Hospital Center
  - » Shady Grove Adventist Hospital
  - » Suburban Hospital–JHM
  - » University of Maryland Capital Region Medical Center

Out-of-State Cardiac Interventional Centers
- Bayhealth Kent General
- ChristianaCare Hospital
- MedStar Washington Hospital Center
- Nanticoke Memorial Hospital

Burn Centers
- Adult: Johns Hopkins Bayview Medical Center
- Pediatric: Johns Hopkins Children's Center

Out-of-State Burn Centers
- Adult: MedStar Washington Hospital Center
- Pediatric: Children's National Hospital

Eye Trauma Center
- The Wilmer Eye Institute/The Johns Hopkins Hospital

Hand/Upper Extremity Trauma Center
- The Curtis National Hand Center/MedStar Union Memorial Hospital

Neurotrauma Center
- R Adams Cowley Shock Trauma Center/ University of Maryland Medical Center

Perinatal Referral Centers
- Anne Arundel Medical Center
- Frederick Health
- Greater Baltimore Medical Center
- Holy Cross Hospital
- Howard County General Hospital–JHM
- Johns Hopkins Bayview Medical Center
- The Johns Hopkins Hospital
- MedStar Franklin Square Medical Center
- Mercy Medical Center
- St. Agnes Hospital
- Shady Grove Adventist Hospital
- Sinai Hospital
- University of Maryland (UM) Medical Center
- UM Capital Region Medical Center
- UM St. Joseph Medical Center

Acute Stroke Ready Center
- UM Upper Chesapeake Medical Center at Aberdeen

Comprehensive Stroke Centers
- The Johns Hopkins Hospital
- MedStar Franklin Square Medical Center
- University of Maryland Medical Center

Primary Stroke Centers
- Adventist HealthCare White Oak Medical Center
- Anne Arundel Medical Center
- Atlantic General Hospital
- Calvert Health Medical Center
- Carroll Hospital Center
- ChristianaCare, Union Hospital
- Doctors Community Hospital
- Frederick Health
- Greater Baltimore Medical Center
- Holy Cross Germantown Hospital
- Holy Cross Hospital
- Howard County General Hospital–JHM
- Mercy Hospital Center
- Meritus Medical Center
- MedStar Good Samaritan Hospital
- MedStar Harbor Hospital
- MedStar Montgomery Medical Center
- MedStar Southern Maryland Hospital Center
- MedStar St. Mary's Hospital
- MedStar Union Memorial Hospital
- Northwest Hospital
- St. Agnes Hospital
- TidalHealth Peninsula Regional Medical Center
- University of Maryland (UM) Medical Center Midtown Campus
- UM Baltimore Washington Medical Center
- UM Capital Region Medical Center
- UM Charles Regional Medical Center
- UM Shore Medical Center at Easton
- UM St. Joseph Medical Center
- UM Upper Chesapeake Medical Center
- UPMC Western Maryland

Thrombectomy-Capable Primary Stroke Centers
- Sinai Hospital
- Shady Grove Adventist Hospital
- MedStar Franklin Square Medical Center
- Suburban Hospital–JHM

POISON CONSULTATION CENTER
- Maryland Poison Center/University of Maryland School of Pharmacy

DESIGNATED TRAUMA CENTER CATEGORIZATION

Differences in Standards Based on Physician Availability and Dedicated Resources	PARC	Level I	Level II	Level III
For the "most critical patients", an in-house fellowship-trained attending trauma surgeon, trauma fellow, or trauma equivalent/PGY5+ general surgery resident should be at the bedside upon arrival, documented at least 80% of the time.	X			
Dedicated facilities (Resuscitation Unit, Operating Room, and Intensive Care Unit) 24 hours a day	X			
Facilities (Resuscitation Area, Operating Room, and Intensive Care Unit) 24 hours a day		X	X	X
Trauma Surgeon available in-house at all times shall be at the bedside within 15 minutes of call request, documented at least 80% of the time		X	X	
On-call Trauma Surgeon shall be at the bedside within 30 minutes of call request, documented at least 80% of the time of call request				X
Anesthesiologist in-house dedicated 24 hours a day to trauma care, should be at the bedside upon arrival, documented at least 80% of the time	X			
Anesthesiologist in-house at all times but shared with other services and shall be at the bedside within 15 minutes of call request		X	X	X
Orthopedic Surgeon in-house at all times and dedicated to trauma care	X	X		
Orthopedic Surgeon on-call shall be at the bedside within 30 minutes of call request, documented at least 80% of the time of call request			X	X
Neurosurgeon in-house at all times and dedicated to trauma care	X			
Neurosurgeon in the hospital at all times but shared with other services		X		
Neurosurgeon on-call shall be at the bedside within 30 minutes of call request, documented at least 80% of the time of call request			X	X
A designated fellowship-trained/board-certified in surgery or critical care surgical director of the Intensive Care Unit	X	X	Desired	
An organized trauma research program with a designated physician director and documented research plan	X	X		
Education – Fellowship Training in Trauma	X			
Surgical Residency Program	X	X		
Injury Prevention and Public Education Program	X	X	X	X

MARYLAND EMS SYSTEM TRAUMA AND SPECIALTY CENTER REPORTS

Primary Adult Resource Center

R Adams Cowley Shock Trauma Center

22 S. Greene Street, Baltimore, Maryland
MIEMSS Region III

Located within the University of Maryland Medical Center, the R Adams Cowley Shock Trauma Center (RACSTC) serves as the state's Primary Adult Resource Center. As a multidisciplinary clinical, educational, and research institution, RACSTC is dedicated to world-class standards in the prevention and management of critical injury and illness.

From June 1, 2023, through May 31, 2024, RACSTC treated 6,212 primary trauma patients, according to the Maryland State Trauma Registry. Over this 12-month period, 84% of patients admitted to RACSTC arrived by ground transportation and 16% arrived by air. Demographic data indicates that the majority of admissions were male (65%) and aged 56 or older (40%), followed by those aged 15-35 years (34%), and those aged 36-55 (24%).

Center for Hyperbaric and Dive Medicine

The Center for Hyperbaric and Dive Medicine is the statewide referral center for individuals who experience decompression sickness, carbon monoxide poisoning, gas embolism, smoke inhalation, delayed effects of radiation treatment, diabetic wounds, and severe necrotizing soft-tissue infections. It is the only 24/7 critical care-capable chamber in the region and is internationally recognized for its leadership and expertise in the clinical application of hyperbaric therapy. The Center performs clearance to SCUBA dive physicals for both recreational and commercial divers. The Center is an enrollment site for the Hyperbaric Oxygen Brain Injury Trial (HOBIT) to test hyperbaric hyperoxia for severe traumatic brain injury in the initial stage of hospitalization. In addition, the Center also routinely tests new equipment to be used under pressure for clinical use.

This year, the Center for Hyperbaric and Dive Medicine provided 4,221 dive hours of therapeutic hyperbaric oxygen treatment (HBO). Of these, 21% were inpatients, 78% were outpatients, and 0.7% were emergent.

The GO-TEAM

A joint effort between RACSTC and Fire, Rescue, EMS, and Aeromedical Services throughout the region, the GO-TEAM is a specialized component of Maryland's statewide EMS system. As RACSTC's rapid-deployment arm, it enables the extrication, resuscitation, and stabilization of patients prior to and during transport to advanced hospital facilities. In collaboration with MIEMSS and Maryland State Police Aviation Command, the GO-TEAM delivers anesthetic, surgical, and resuscitative services to the prehospital arena and renders life-saving interventions at the scene of injury. Each GO-TEAM activation brings an attending physician and nurse anesthetist to the patient's side, whether on a highway, in the Chesapeake Bay, or at the bottom of a ravine.

This year saw 13 GO-TEAM activations, with six (6) patient retrievals, including Allegany County (MVC with Entrapment), Baltimore County (MVC with Entrapment), Cecil County (MVC), Franklin County PA (Industrial Accident with Entrapment), Harford County (MVC with Entrapment), and Worcester County (MVC with Entrapment). Five (5) patients from these incidents were transported to the R Adams Cowley Shock Trauma Center and one (1) was transported to WellSpan York Trauma Center.

This year, the GO-TEAM offered educational opportunities to prehospital clinicians, including seven on-site visits by the GO-TEAM, two webinars, GO-TEAM presentations at the Winterfest EMS Conference and the Maryland State Firefighters Association Annual Convention and Conference, and education provided to Maryland State Police paramedics covering such topics as prehospital care for traumatic brain and spinal cord injuries, resuscitative endovascular balloon occlusion of the aorta (REBOA), blunt trauma, crush injuries, and prehospital management of peri-arrest/circulatory arrest. In addition, the GO-TEAM offers a post-event debriefing with EMS clinicians following each GO-TEAM deployment.

Military-Civilian Partnerships

Since 2001, US Air Force Medical Service personnel have traveled to Baltimore for training at the US Air Force Center for the Sustainment of Trauma and Readiness Skills (C-STARS), embedded within RACSTC. These civilian-military partnerships are crucial in keeping military medics continuously ready for wartime casualty care. In February 2024, C-STARS Baltimore hosted Maj. Gen. Jeannine Ryder, Chief Nurse for the US Air Force, for a full-day visit sharing best practices and successes of the Baltimore C-STARS program. In In addition to providing educational observation experiences to the Air Force, RACSTC now provides these experiences to Walter Reed National Military Medical Center surgeons, nurses, and technicians.

Injury Prevention Programs and Initiatives

RACSTC's Center for Injury Prevention and Policy (CIPP) focuses on identifying injury trends and delivering statewide injury prevention education. This year, CIPP presented a total of 314 events reaching over 9,000 community members across at least nine Maryland counties. These programs include the Violence Prevention Program, Intimate Partner Violence (Bridge) Program, Stop the Bleed® (STB) Program, Trauma Survivors Network, ThinkFirst® National Injury Prevention Foundation, and Adult Court-Ordered Drinking Driver Monitor Program. This year, RACSTC partnered with Baltimore County Public Schools

to launch STB into their high school curriculums, including training of staff and equipping schools with training materials. CIPP collaborated with the Maryland Committee on Trauma to co-sponsor a statewide event for National Stop the Bleed® day. The Violence Prevention Program grew participation in primary prevention programming for high-risk youth by 199%, reaching over 266 participants and educating about making informed decisions to help change life trajectories. In partnership with ThinkFirst® National Injury Prevention Foundation, over 1,500 teens were educated about head injury prevention and/or risky teen behaviors, including distracted driving. A growth of 137% in prevention programming from last year continues to reflect CIPP's mission to educate all Marylanders to reduce preventable injuries, equip them with skills that could help save lives, and create a culture of injury prevention throughout the state.

Quality Management and Improvement

RACSTC maintains a complete and comprehensive quality management program. It monitors all aspects of care from prehospital trauma-line consulting to peer review of patient deaths and complications. The program benchmarks the best practices of other institutions and integrates quality activities of other specialty services that provide care to critically ill and severely injured patients. The multidisciplinary Quality Improvement Committee outlines program quality, monitors performance, and develops new initiatives. Over the past year, RACSTC's quality improvement efforts have included initiatives focused on improving outcomes in its elderly patient population, reducing length of stay, and preventing readmissions specifically through improvements in post-discharge follow-up care and its Trauma Survivors network.

In 2024, the University of Maryland Medical Center Downtown Campus earned its fourth consecutive Magnet designation, the highest honor bestowed by the American Nurses Credentialing Center (ANCC) and the gold standard for nursing. Fewer than 10% of hospitals nationwide have achieved this designation — just 2% have earned it at least four times.

EMS Outreach and Educational Activities

By focusing on patient care trends, RACSTC expanded and advanced its educational programs this year, delivering lectures and participating in case reviews with local jurisdictions. In December, the EMS Liaison team hosted the RACSTC Best Practices in Trauma Care EMS conference. Presentations covered current trends in trauma care and their application in the prehospital environment. RACSTC's EMS Educational Broadcasts continued to offer the opportunity for EMS clinicians to partner with RACSTC in presenting case studies which provide education encompassing care from the field through hospital discharge. Topics covered included assessment and care of the multiple mechanism patient and challenges in the care of out-of-hospital cardiac arrest management. Additional EMS education is offered through the Center for Critical Care Training and Education (CCCTE) and is outlined below. This year, EMS education reached over 450 EMS clinicians.

Members of RACSTC's EMS liaison team provide education to their assigned EMS jurisdictions. A virtual tour video is available which offers EMS students, clinicians, and other first responders an opportunity to better understand the process of transporting patients to RACSTC. Observation opportunities are available to EMS clinicians in the Trauma Resuscitation Unit and Critical Care Units; 87 EMS clinicians observed this year.

The Trauma Observation Program provides healthcare professionals with a current understanding of their particular area of interest through clinical interactions, meetings and lectures, rounds, and observation of operational procedures. Program participants include EMS students, pre-med students, military medics, nurses, high school trainers, nurse practitioners, and physicians. The program welcomes both national and international participants. This year, RACSTC welcomed 63 participants.

RACSTC conducted additional educational outreach to EMS at a number of conferences, including the Winterfest EMS Conference, Miltenberger Emergency Services Seminar, and the Maryland State Firefighters Association Annual Convention and Conference.

RACSTC continued to support continuing education for EMS, Nursing and Physicians both at a national and international level with presentations at professional conferences including Austin Trauma and Critical care Conference, American Association for the Surgery of Trauma Meet the Mentors Program, 35th Brazilian Congress of Surgery, St. Francis Trauma Symposium, American Association for the Surgery of Trauma, Eastern Association for the Surgery of Trauma, and Society of Trauma Nurses. In addition, staff from multiple disciplines continue to be published in peer-reviewed journals, including The American Surgeon, Journal of Trauma Acute Care Surgery, Journal of the American College of Surgeons, Journal of Surgical Research, The Spine Journal, and Trauma Surgery and Acute Care Open.

Center for Critical Care Training and Education (CCCTE)

The Center for Critical Care Training and Education (CCCTE) offers a robust educational schedule, and has built environments to mimic every phase of patient care within the Primary Adult Resource Center. CCCTE hosts many certification courses, including Advanced Trauma Life Support (ATLS) and Advanced Trauma Care for Nurses (ATCN). Advanced trauma skills training includes Basic Endovascular Skills for Trauma, Extracorporeal Membrane Oxygenation (ECMO) and ultrasound training. This year, CCCTE provided more than 530 course sessions to more than 9,500 participants from around the world, including EMS clinicians, medical students, attending physicians, and nurses. In addition, CCCTE provides EMS training for Maryland State Police, Maryland Express Care, Harford EMS, US Army National Guard, FBI Field Agents, and volunteer organizations, and hosts community outreach educational programs including

Stop the Bleed®, Minds of the Future, and the Edmonson High School Scrub Tech Program. Learn more at https://www.umms.org/ummc/pros/critical-care-trauma-education.

Research

Research projects are designed to enhance the trauma system's ability to resuscitate, stabilize, and treat the needs of trauma patients. RACSTC conducts research under the umbrella of the Shock, Trauma, and Anesthesiology Research – Organized Research Center (STAR-ORC), a multidisciplinary research and educational center focusing on brain injury, critical care and organ support, blood and resuscitation, surgical outcomes, patient safety, and injury prevention. STAR-ORC is the first research center in the nation dedicated exclusively to the study of trauma, its complications, and prevention.

As of June 30, 2024, RACSTC had more than 21 clinical studies either underway or upcoming. Topics include, but are not limited to, traumatic brain injury, hemorrhagic shock, venous thromboembolism therapies, biomechanics of motor vehicle crash-related injury, big data and artificial intelligence and augmented reality. Its research partners include the National Institutes of Health (NIH), the US Air Force, Department of Defense, and Defense Advanced Research Projects Agency (DARPA), National Highway Traffic Safety Administration and others.

This past year, RACSTC continued as one of the leading enrollment sites for the NIH-funded Hyperbaric Oxygen Brain Injury Treatment Trial (HOBIT) examining the potential benefits of hyperbaric oxygen therapy on traumatic brain injury. RACSTC was awarded a $7 million DARPA study to build a database of non-invasive and invasive vital signs collected in real-time to evaluate the efficiency of helicopter transport, trauma center reception, resuscitation and stabilization (Shock Trauma Center Research Infrastructure for Trauma with Medical Observations – STC RITMO). RACSTC is a participating site in a large multicenter Trauma Resuscitation with Group O Whole Blood or Products (TROOP) study to examine whether patients who are injured and bleeding do better after receiving whole blood or blood components.

Legislation

RACSTC's Legislative Committee plays a significant role in advocating for crucial improvements in trauma care and patient support across Maryland. The Legislative Committee provided expert testimony in a number of key pieces of legislation during the 2024 Maryland Legislative Session, including: advocating for reform and broader expansion of victim compensation funding in Maryland, the importance of upholding helmet safety laws, the creation of a statewide Gun Violence Prevention Center and, most notably, for the increase and sustained funding for Maryland Trauma and EMS system. Working with all the regional trauma centers and Maryland Emergency Medical System Operations Fund (MEMSOF) partners, RACSTC helped to pass landmark legislation ensuring a sustainable future for the Maryland Trauma Care system.

Rehabilitation Services

RACSTC emphasizes early patient mobilization at the beginning of the Advanced Trauma Life Support rehabilitative process. A highly-trained interdisciplinary team of physicians, nurses, therapists and ancillary care providers participate in extensive daily interactions and disposition rounds to problem solve and set the clinical plan for their complex, multi-system patients. This interdisciplinary approach facilitates utilization of therapy services through the full continuum of care, from the Trauma Resuscitation Unit (TRU) to follow-up clinics after discharge. In addition, the RACSTC rehab team serves as a specialty resource for local, regional, and national providers and professional associations. The University of Maryland Rehabilitation & Orthopedic Institute and the UMMC Midtown Campus primarily provide post-acute inpatient and outpatient services for RACSTC patients.

Level I Adult Trauma Center

The Johns Hopkins Hospital

1800 Orleans Street, Baltimore, Maryland
MIEMSS Region III

The Johns Hopkins Hospital (JHH) is a designated Level I Adult Trauma Center serving Baltimore City and its surrounding counties, as well as patients throughout the state and region. JHH strives to improve the health of the community and the world by setting the standard of excellence in medical education, research, and clinical care. Diverse and inclusive, Johns Hopkins Medicine educates medical students, scientists, healthcare professionals and the public. It conducts biomedical research and provides patient-centered medicine to prevent, diagnose, and treat human illness. The trauma acute care surgery departments of JHH and Johns Hopkins Bayview Medical Center are unified under a single division of Acute Care Surgery.

From June 1, 2023, through May 30, 2024, JHH treated 2,835 trauma patients, according to the Maryland State Trauma Registry. Adult trauma services are provided by the Division of Acute Care Surgery within the Department of Surgery. This year, US News & World Report again counted JHH among the nation's top five hospitals in its Best Hospitals 2024 rankings.

Quality Management and Improvement

Johns Hopkins Hospital (JHH) continues to lead in quality and safety, having received an A grade from Leapfrog for patient safety, as well as the American College of Surgeons NSQIP's Meritorious Status.

JHH introduced additional quality improvement initiatives in FY 2024:

- **Trauma Quality Improvement Program:** JHH enrolled as a TQIP Center to help benchmark their program and

enhance the quality of trauma care.

- **Trauma Bypass Rate Maintenance:** Over the last five years, JHH has successfully maintained a Trauma Bypass Rate below 1%.
- **Trauma Data Automation for Johns Hopkins Health System:** Expanding automation tools to encompass the entire Johns Hopkins Health System helps to improve data accuracy and accessibility.
- **New Trauma Team Manual for Emergency Department/ Trauma Collaboration:** JHH developed a comprehensive manual to enhance coordination and efficiency between emergency department staff and the trauma team.
- **Nurse Navigator:** JHH hired Anne Wouapet as Acute Care Surgery/Trauma Nurse Navigator, to improve access for patients who were previously lost to follow-up, ensuring continuity of care and better outcomes for trauma patients in the outpatient setting. The Nurse Navigator has been instrumental in bridging the gap between inpatient and outpatient care, enhancing the overall patient experience.
- **Health System Platform for Trauma Nursing Orientation/Continuing Education:** The conversion of Trauma Nursing Orientation and Continuing Education into a standardized online platform for the entire Johns Hopkins Health System ensures consistent training and knowledge dissemination for all adult trauma nursing staff.

These initiatives reflect JHH's ongoing commitment to setting the standard in trauma care quality and patient safety.

Injury Prevention Program

The Johns Hopkins Adult Trauma Division is dedicated to reducing harm and preventing injuries through education, training, and outreach. Through the use of geocaching, the Division leverages Trauma Registry data to reduce injury through outreach and prevention in the areas most affected: violence, home safety (falls, lacerations, etc.), and motor vehicle safety.

This year, JHH bolstered its injury prevention efforts by hiring Injury Prevention Coordinator Christina Interrante, MSN, RN, who has expanded JHH's community involvement through various outreach programs and initiatives. In addition, JHH transitioned the Johns Hopkins Hospital Break the Cycle Violence Intervention Program (JHH BC-HVIP) from the Care Coordination Division to the Adult Trauma Division. The Adult Trauma Division now consists of three dedicated professionals – Alexandra Glover (Social Worker and Program Manager for the BC-HVIP) and two Violence Intervention Specialists (VIS), Nadir Abdullah and Ihsan Cornish – who work to improve the lives of victims of violence daily.

This year, JHH was designated a Trauma Survivors Network Facility, underscoring its commitment to supporting trauma survivors through their recovery journey, providing resources, support groups, and educational materials to help them and their families navigate the challenges following a traumatic injury.

Key Metrics

- **Total Health System Injury Prevention Outreach Hours:** 452 hours
- **Total Health System Injury Prevention Staff/Volunteers Involved:** 444 individuals
- **Number of Individual Encounters Reached Through the Program:** 5,326 individuals
- **Percentage Analysis of External Outreach Project by Type:**
  - **Violence Prevention Projects (including Stop the Bleed® and Gun Safety):** 25%
  - **Home Safety Projects (Falls, lacerations – including Senior Lifestyle Injury Prevention Program (SLIP), Stop the Bleed®, Occupational Safety):** 40%
  - **Motor Vehicle Safety Projects:** 35%

JHH leverages its health system model for injury prevention strategies, with an emphasis on collaboration with the other prominent Johns Hopkins Health System Trauma/Burn/Eye Centers (including Johns Hopkins Bayview Medical Center and Suburban Hospital) to support a wider reach of patients. This model enhances the community involvement and impact of injury prevention efforts, fostering a comprehensive approach to community health and safety.

JHH continued to play a significant role in major Injury Prevention events. During Stop the Bleed® Day, hosted by the Maryland Committee on Trauma, JHH trained over 200 Marylanders in Stop the Bleed®. In addition, JHH collaborated with numerous community partners at the Johns Hopkins Break the Cycle Summit to address and develop solutions for various forms of violence. JHH participated in Trauma Survivors Day on May 15, 2024, by honoring three remarkable survivors for their resilience and strength. Johns Hopkins Hospital's injury prevention initiatives exemplify a comprehensive, collaborative approach to public health. Through significant outreach efforts, extensive staff involvement, and strategic partnerships with Johns Hopkins Bayview Medical Center and Suburban Hospital, JHH continues to lead the way in promoting safety and preventing injuries within the community.

EMS Education

The Johns Hopkins Hospital (JHH) remains at the forefront of EMS education, actively engaging in quality improvement and providing essential follow-up, continuing education, and professional development to EMS professionals. Additionally, JHH serves as a site facility for five EMS education programs, utilizing its EMS boardroom to deliver comprehensive educational services to EMS clinicians who bring patients to JHH for care.

Trauma education is a top priority at the JHH trauma center. Our

trauma and emergency medicine attending physicians impart their knowledge through various advanced courses, including Advanced Trauma Operative Management, Advanced Trauma Life Support, Advanced Surgical Skills for Exposure in Trauma, and Rural Trauma Team Development. This year, many of JHH's trauma physicians offered invaluable contributions and insight as session moderators, visiting professors, and keynote speakers at local, national, and international conferences. In addition, they shared their expertise with members of the US Congress and military, extending JHH's influence and impact on trauma education.

JHH is committed to supporting EMS and transport education through key local initiatives, including the biannual Topics in EMS conference and the Mid-Atlantic Trauma Conference (MATC).

- **Topics in EMS Conference:** This biannual event, hosted by JHH, underscores JHH's dedication to education and professional development by providing EMS professionals with a forum in which to discuss the latest advancements, share best practices, and collaborate on improving patient care. The conference serves as a critical platform for knowledge exchange and professional growth.
- **Mid-Atlantic Trauma Conference (MATC):** MATC featured notable presentations by experts from across Maryland, including Shawn Trautman and Dr. Asa Margolis, who focused on the latest advancements in transport care, trauma-specific care, and innovative EMS practices. The conference fosters an environment of learning and collaboration among EMS professionals, emphasizing JHH's commitment to leading discussions that drive progress in trauma care and EMS education.

Research

The Division of Acute Care Surgery at The Johns Hopkins Hospital actively engaged in a variety of research projects this year. Some key areas of research included gun violence prevention; trauma clinical outcomes; global surgery initiatives; surgical education; and public health research on trauma care and gun violence. These projects demonstrate the hospital's commitment to advancing surgical care and improving patient outcomes through innovative research and global collaboration.

Rehabilitation Services

The JHH Department of Physical Medicine and Rehabilitation (PMR) provides a wide range of rehabilitation services to trauma patients, from the bedside to inpatient rehab and home services. Opened in 2017, the Comprehensive Integrated Inpatient Rehabilitation Program is a state-of-the-art, 18-bed inpatient rehabilitation unit offering unique features that include a mock apartment where patients can practice the tasks of living independently and a "streetscape" area for patients to rehearse activities of daily living, such as grocery shopping and using an ATM.

This year, the PMR expanded its services and initiatives to further enhance patient recovery and reintegration into daily life. New programs include advanced tele-rehabilitation services, allowing patients to receive continuous care and guidance even after discharge. This initiative has significantly increased access to rehabilitation services for patients who may face mobility or transportation challenges. These enhancements reflect JHH's commitment to providing comprehensive, cutting-edge rehabilitation services that support the best possible outcomes for trauma patients.

Level II Adult Trauma Center

Johns Hopkins Bayview Medical Center

4940 Eastern Avenue, Baltimore, Maryland
MIEMSS Region III

Johns Hopkins Bayview Medical Center (JHBMC) is a designated Level II Adult Trauma Center serving eastern Baltimore City, eastern Baltimore County, Harford County, and Cecil County. As a member of Johns Hopkins Medicine, JHBMC provides emergency access to surgical care for acutely injured patients with time-sensitive injuries. The program provides patient-centered comprehensive care to all trauma patients, incorporating a multidisciplinary, collaborative approach, and evolves by implementing protocols that address patient, community, and institutional needs.

From June 1, 2023, through May 31, 2024, the JHBMC Emergency Department evaluated more than 4,700 patients triaged by EMS for specialty trauma care, and entered 2,800 trauma patients, according to the Maryland State Trauma Registry. Adult trauma care services at JHBMC are provided by the Johns Hopkins School of Medicine Department of Surgery's Division of Acute Care Surgery.

JHBMC is one of the state's busiest trauma centers by volume. The trauma and emergency surgery services of both JHBMC and The Johns Hopkins Hospital are unified under a single Division of Acute Care Surgery, and provide trauma attending physician support to both trauma centers. The Bayview Trauma Advanced Practice Providers (APP) Service has been expanded to four APPs who provide care exclusively for trauma patients facilitating more admissions to the Trauma Service with the goal of better patient outcomes through dedicated, specialized care. The trauma service is currently developing a geriatric trauma service and plans to implement a geriatric hip fracture pathway to improve outcomes in the geriatric population.

JHBMC recognized National Trauma Awareness Month in May 2024 by welcoming back two survivors and their families to celebrate their recovery with a special event.

Quality Management and Improvement

Through its quality management process, JHBMC continually improves patient care and outcomes at both the individual and system level. Its multidisciplinary Trauma Joint Practice Committee, consisting of physician liaisons from Emergency Medicine,

Trauma Surgery, Orthopaedic Surgery, and Neurosurgery, reviews patient care to enhance multidisciplinary collaboration and identify improvement opportunities.

Injury Prevention Programs and Initiatives

In May 2024, JHBMC held its fourth annual Stop the Bleed® marathon training on National Stop the Bleed® Day, and offered Stop the Bleed® training sessions to local community groups. This year, JHBMC trained 300 hospital personnel and members of the community in Stop the Bleed®. In addition, JHBMC has implemented Stop the Bleed® as an additional training component of Advanced Cardiac Life Support (ACLS).

EMS and Nursing Continuing Education

JHBMC hosted its semiannual Topics in EMS Conference for EMS clinicians in the spring and fall. This full-day hybrid course includes trauma and burn injury content. In addition, EMS educational programs are contracted with JHBMC for clinical learning opportunities. It provides further continuing education for its EMS colleagues via an educational board in the ED. JHBMC is committed to improving patient outcomes through enhancing the knowledge of its nursing and ancillary staff. This year, JHBMC continued to support nursing staff participation in the Emergency Nurses Association Trauma Nursing Core Curriculum and the Society of Trauma Nurses Advanced Trauma Care for Nurses Courses.

Research

The integrated Division of Acute Care Surgery continued to provide JHBMC with opportunities to join new and ongoing research initiatives focused on trauma care.

Rehabilitation

Approximately one-third of admitted trauma patients require a period of rehabilitative care after hospitalization, especially older patients with pre-existing comorbidities. JHBMC has access to an inpatient acute rehabilitation center on its campus to provide patients with this level of care. JHBMC's Social Work and Case Management Services assess each individual patient's post-discharge needs prior to their release from the hospital.

Level II Adult Trauma Center

University of Maryland Capital Region Medical Center

901 Harry S. Truman Dr. N., Largo, Maryland
MIEMSS Region V

The University of Maryland Capital Region Medical Center (Cap Region) is a designated Level II Adult Trauma Center serving Prince George's County and adjacent areas, including Washington, DC. With four major highways nearby, the hospital is an ideal location for local EMS transport and public accessibility. Cap Region is committed to restoring the quality of life for all of its patients and their families, beginning with prehospital communication and extending throughout their hospital stay, and long after discharge. From June 1, 2023, to July 31, 2024, Cap Region treated 9,365 trauma patients, according to the Maryland State Trauma Registry.

Opened on June 12, 2021, Cap Region's state-of-the-art facility features five treatment bays within a large trauma resuscitation unit, an operating room dedicated to trauma surgery, one operating room dedicated to acute care surgery, and one hybrid operating room dedicated to vascular, orthopedic, and trauma care. Its Acute Care Surgery and Trauma faculty consists of five board-certified surgical critical care full-time Associate Professors as well as one part-time surgeon and two community-practice surgeons with decades of trauma experience.

This year, Cap Region hosted rotating acute care surgery fellows from the R Adams Cowley Shock Trauma Center in Baltimore and supported the education of Howard University surgery residents at every level of their training, as well as rotating residents from Walter Reed National Military Medical Center, Ross University, and Anne Arundel Medical Center. In July 2022, Cap Region was designated a Kaiser facility, expanding its coverage for the population of Prince George's County. In March 2023, Cap Region launched its first Sickle Cell Clinic, and in April 2024 opened its new Center for Advanced Medicine.

Quality Management and Improvement

Acute Care Surgery's quality management program consists of a multidisciplinary care team whose collaborative efforts align positive patient outcomes with clinical expertise and best practices and ensure access to necessary resources. Multiple monthly comprehensive case and peer reviews, loop closures, and process improvement initiatives reflect Cap Region's commitment to improving the care and outcomes of injured patients.

Injury Prevention Programs and Initiatives

This year, Cap Region educated over 1,200 persons through its injury prevention programs and initiatives. Inpatients received injury-specific prevention and awareness resources daily. Cap Region offered injury prevention information and tips, such as the myriad Trauma Awareness and Prevention activities held during National Trauma Awareness Month, in May 2024, fall prevention demonstrations, and Stop the Bleed® training. In addition, Cap Region educated the Prince George's County community Stop the Bleed® and trained 150 Prince George's County school nurses. In conjunction with its Community Health and Domestic Violence and Sexual Assault Center, Cap Region participated in community events, and visited multiple community centers for aging, providing general injury prevention awareness. It distributed bicycle helmets and car seats and actively participated in the DC Trauma Injury Prevention Coordinators Collaborative. The Capital Region Violence Intervention Program expanded its program over the previous year, from 50 participants to 85. The

program provides weekly virtual men's group meetings and an outdoor basketball group, enabling continued contact with survivors and ensuring the provision of post-discharge mental health and resource support necessary for a full recovery. Cap Region Violence Intervention Program held its second annual Health and Wellness fair showcasing survivors of violence who have participated in the program.

EMS and Nursing Continuing Education

The Acute Care Surgery team provides enhanced EMS collaboration with Prince George's Emergency Medical Services as well as Prince George's Office of Emergency Management. Nursing education opportunities has ramped up to include in-person training, skills simulation stations, lectures specific to the care of the injured patient, and full-scale exercises that mimic real-life scenarios.

Research

Cap Region's Trauma Registry and Acute Care Surgery team support internal, local, and multi-institutional research efforts to identify trends, improve outcomes, and evaluate injury prevention efforts. This year, it actively collaborated with the R Adams Cowley Shock Trauma Center and the University of Maryland School of Public Health. However, research on violence intervention and recidivism remains a top priority for the team. Due to this research, increased funding has been awarded to the Violence Intervention Program.

Rehabilitation

The Physical Medicine and Rehabilitation teams collaborate to ensure that the physical, occupational, and speech-language therapy needs of the injured patient are met. This year, the Physical Medicine Department continued its collaboration with the Acute Care Surgery team to focus on early ambulation and discharge for Cap Region's injured patients.

Level II Adult Trauma Center

Sinai Hospital

2401 West Belvedere Avenue, Baltimore, Maryland
MIEMSS Region III

Sinai Hospital (Sinai) is a designated Level II Adult Trauma Center serving the Greater Baltimore Metropolitan Area. As part of the LifeBridge Health System, Sinai's mission is to maintain and improve the health of the individuals and communities it serves through compassionate, high-quality care. LifeBridge Health offers comprehensive treatment and preventative wellness services. In addition, Sinai Hospital is dedicated to educating medical students and residents, and engaging in research to improve lives throughout Maryland and worldwide. Sinai treated 2,655 trauma patients from June 1, 2023, through May 31, 2024, according to the Maryland State Trauma Registry. Adult trauma services at Sinai are provided by the Acute Care Division of Surgery.

The Emergency Department's Trauma Committee is responsible for many of the emergency department's trauma care protocols. Its process for ensuring timely antibiotic administration for open fractures led to 100% compliance within one hour of emergency department arrival in FY 2024.

During the 2024 Maryland Legislative Session, Sinai Hospital partnered with State Legislators, TraumaNet, the Maryland HealthCare Commission (MHCC), the Health Services Cost Review Commission (HSCRC), and other state Trauma Centers to revise and update the Maryland Trauma Physicians Services Fund. Through these collaborative revisions, Sinai helped to secure much-needed funding to ensure the State of Maryland's Trauma System remains the best in the nation when providing care to injured citizens across the State.

In May 2024, Sinai's Division of Trauma partnered with the Maryland Committee on Trauma at the annual Point Counterpoint Conference, providing three industry-leading team members to speak on topics that included traumatic brain injury, disparities in healthcare, and bridging the generational gaps in the workforce.

Injury Prevention Programs and Initiatives

For the fourth consecutive year, Sinai Hospital, in partnership with Injury Free Coalition for Kids (a national organization dedicated to preventing injury in children), joined many other hospitals and businesses across the country in turning its facilities green for Injury Prevention Day.

Sinai brought its Stop the Bleed® program to several area schools, local businesses, and organizations to train over 300 participants. In addition, Sinai partnered with the Maryland Committee on Trauma to provide ongoing Stop the Bleed® trainings to students, community members, and healthcare professionals throughout the state of Maryland.

In May 2024, Sinai collaborated with the Center for Hope on the Red Desk Project for the fourth consecutive year. A display of red desks – each representing a child's life lost to homicide in Baltimore City – was placed outside of the Center for Hope and Sinai Hospital. A press conference and gathering of regional leaders was held to take a call to action to prevent child homicide and violence throughout Baltimore. The red desks remained on display through June 7, 2024 – National Gun Violence Awareness Day.

Quality Measures and Improvement

This year. Sinai Trauma Services actively continued its quality improvement initiatives. Partnering with its system-wide LBH Quality and Patient Safety Department and various multidisciplinary hospital committees allows the Division of Trauma to review cases concurrently and retrospectively at individual, unit, divisional, and system levels. Through a large multidisciplinary approach, providers from all services involved in the care of injured persons routinely review and implement best practices to

improve the outcomes and experience for trauma patients.

As a state Level II Trauma Center, Sinai's emergency department has partnered with the Division of Trauma and Pediatric Hospital to participate in the American College of Surgeons Pediatric Readiness Project. Through collaborative efforts across Sinai's Division of Trauma, Hospital Violence Intervention Program, the Center for Hope, Safe Streets, and other community organizations, the Sinai community significantly reduced gun violence this year. Sinai Hospital saw a 35% reduction in patients presenting with firearm injuries from the prior fiscal year.

EMS and Nursing Continuing Education

In November 2023, Sinai's emergency department opened its brand-new ambulance offloading area. The new ambulance bay provides a large space for ambulance triage and features six bays equipped with cardiac monitoring for expedited patient acceptance and offloading. This new area and process helps Sinai's EMS colleagues to more quickly return to delivering prehospital care across the community.

Sinai's emergency department and Surgery Residency program, in collaboration with its sim lab, holds quarterly multidisciplinary trauma simulations. In January 2023, Sinai's Trauma Program expanded those partnerships to include Sinai's OB/GYN residency program to run exercises and prepare for accepting the pregnant trauma patient. Through the guidance of Sinai's Trauma Surgery Attendings, these simulations strengthen relationships and provide opportunities for educational growth and development between the teams. In the future, Sinai hopes to include its EMS partners in these simulations.

Sinai Hospital partnered with Baltimore County and Howard County EMS to provide their paramedics rotations through Sinai's operating rooms for advanced management training. In May 2024, Sinai offered EMS clinician education using point-of-care ultrasound for trauma during the Baltimore County Fire Department's EMS Academy series. In addition, Sinai provided a lecture for EMS clinicians on Respiratory Therapy for the Prehospital Care Provider, Nasal Cannula to Intubation at Baltimore County Fire Department's EMS Academy series.

Fellowships and Residencies

Sinai is the third largest teaching hospital in the state, training residents in multiple specialties. All surgical residents and advanced practice providers at Sinai maintain current ATLS, ACLS, and BLS certifications. The surgical residents also have the opportunity to pursue additional trauma training in Advanced Trauma Operative Management, Focused Abdominal Sonography in Trauma, and Advanced Surgical Skills for Exposure in Trauma. Sinai's residents complete four-week rotations at the University of Maryland Medical Center during their post-graduate III year, focusing on pediatric surgery, Johns Hopkins main campus focusing on transplant surgery, and at Johns Hopkins Bayview Medical Center during their post-graduate II year focusing on burn surgery and wound care. Sinai has added its residency program to a global surgery rotation at Hospital Santo Tomas in Panama City, Panama; this four-week trauma rotation is available for one post-graduate IV resident per year.

Research

LBH Department of Research provides opportunities for all levels of providers and staff to participate in research initiatives, including those that advance trauma care. This year, Sinai's Division of Trauma partnered with its Geriatric Surgery program and the Department of Advanced Orthopedics on research projects to further enhance the care that Sinai provides to its injured patients.

Rehabilitation

Sinai rehabilitation center services are integrated throughout the patient's stay at Sinai Hospital. When a patient is ready for discharge, Sinai can accommodate qualifying patients in its 43-bed inpatient rehabilitation center. It offers a full spectrum of rehabilitation services, including pain management, physical therapy, occupational therapy, and speech-language therapies. The rehabilitation center supports patient care with specialists in physiatry, social work, and rehab psychology, and offers programs for balance and dizziness, driving evaluation, return-to-work, and a brand-new division of rehabilitation engineering The ABBEL Research division. As of FY 2024, the team includes five APTA neuro-certified specialists (NCS), five orthopedic certified specialists (OCS) and one geriatric certified specialist (GCS). In addition, Sinai has launched an ABPTRE-accredited residency program and graduated its first Neuro Physical Therapy resident. Recently, Sinai completed a $2 million renovation to the outpatient physical therapy facility, adding state-of-the-art equipment, including the C-Mill, Bioness Vector system, and Alter G treadmill. Sinai's goals to improve its rehabilitation services in the coming fiscal year include further expansion of its research and engineering capabilities, enhancing professional development opportunities for Sinai's staff, and maintaining high standards of patient care and advocacy

Level II Adult Trauma Center

Suburban Hospital – Johns Hopkins Medicine

8600 Old Georgetown Road, Bethesda, Maryland
MIEMSS Region V

Suburban Hospital – Johns Hopkins Medicine (Suburban) is a designated Level II Adult Trauma Center serving Montgomery County, but also easily accessible from Frederick and Prince George's Counties. Suburban and its entire staff are dedicated to providing safe, compassionate, and evidenced-based quality care to all injured patients, not only during their hospitalization but throughout the entire continuum of trauma care. From June 1, 2023, through May 31, 2024, Suburban treated 2,500 trauma patients, according to the Maryland State Trauma Registry.

This year, Suburban Hospital partnered with Montgomery County Fire and Rescue to support the development of the Montgomery County Prehospital Blood Program. The life-saving benefit of administering whole blood to hemorrhaging patients in the prehospital setting is well established. Units of whole blood will now be stored at Suburban Hospital for easy access and exchange by EMS personnel.

In an effort to maintain increased readiness for pediatric trauma patients presenting emergently to the trauma resuscitation units, new pediatric equipment and processes were tested by multidisciplinary trauma teams during a Region V Mass Casualty Drill that emphasized injured pediatric patients.

As part of its continued determination to return trauma patients to a productive life, Suburban renewed its memorandum of understanding with Adventist HealthCare Rehabilitation Center for rehabilitation services. Physical, occupational, and speech therapy are provided on-site to trauma patients during their hospital stay. All trauma patients are assigned a case manager and/or a social worker who works closely with the trauma team to make the appropriate referrals to rehabilitation facilities.

On May 15, 2024, the trauma center held its second annual Trauma Survivors Day, celebrating husband-and-wife trauma survivors who graciously shared their story with the trauma teams that cared for them.

Continuing Education Programs

In addition to the open monthly multidisciplinary Mortality and Morbidity Conferences, trauma nursing education hours, including case reviews, continue to highlight educational opportunities from real-world cases. In November 2023, Suburban hosted more than 150 EMS clinicians, nurses, advanced practice providers, and physicians for the yearly Critical Issues in Trauma Seminar. This particular conference included a collaborative case review co-presented by a Suburban Trauma Nurse and a Montgomery County EMS clinician. Planning for the Fall 2024 Seminar is currently underway.

Through a combined agreement with EMS Montgomery County Training Academy and Montgomery County Community College, the Emergency Department serves as a training site for prehospital clinicians. This ongoing collaboration for training and professional development, is further highlighted by the Montgomery County Emergency Preparedness Collaborative (MOCEP), a long-standing local partnership co-chaired by Suburban and EMS, and dedicated to sharing best practices for exercise planning, overall readiness, and response to real-world emergencies. In addition, representatives of Suburban Trauma Services participated in the 2023 annual Montgomery County Emergency Preparedness Fair.

Quality Management Program

In a concerted effort to identify opportunities for improvement at all levels, every trauma patient's chart is regularly reviewed by a trauma clinical data abstractor, a trauma nurse with expertise in performance improvement, the trauma program director, and the medical director of Trauma Services. Additionally, all deaths, transfers, complications, and unexpected treatment outcomes are presented at the monthly Morbidity and Mortality Conference for additional feedback and education.

Injury Prevention Initiatives

Since 2016, Suburban has actively participated in the national Stop the Bleed® campaign. As part of the Maryland Trauma Network's statewide initiative to spotlight National Stop the Bleed® Day on May 25, 2024, the Trauma Center hosted a four-hour Stop the Bleed® Marathon, training more than 70 people and distributing as many Stop the Bleed® kits and tourniquets. Additionally, Suburban Hospital supported the Maryland Committee on Trauma in a large-scale Stop the Bleed® initiative that reached over 200 people. All told, Suburban Hospital Trauma Center taught Stop the Bleed® to over 500 citizens.

Level III Adult Trauma Center

Meritus Medical Center

11116 Medical Campus Road, Hagerstown, Maryland
MIEMSS Region II

Meritus Medical Center (MMC) is a designated Level III Adult Trauma Center serving Washington and Frederick Counties in Maryland, southern Pennsylvania, and the eastern panhandle of West Virginia. MMC's mission and vision to improve the health of our community by being the best health system is supported through its values of integrity, commitment to quality improvement, community focused and teamwork. From July 1, 2023, through June 30, 2024, MMC treated over 3,600 trauma patients, according to the Maryland State Trauma Registry. Adult trauma services are provided by the staff of the emergency department.

This year, MMC's biannual trauma conferences delivered continuing education to more than 300 providers, including EMS clinicians, hospital staff, and other local healthcare providers from outside the organization. Additionally, MMC welcomed a new Trauma Medical Director and the Trauma Acute Care Surgery team, all of whom are fellow-trained and provide 24/7 in-house coverage. In addition, the Trauma Center at Meritus Health launched the Trauma System Clinical Care Conference call, a quarterly virtual and in-person meeting of all persons involved on a case chosen by the Trauma Medical Director. MMC covers care of the trauma patient from the scene through transfer, operating room, and admittance to the hospital, providing valuable feedback to the entire care team.

Quality Management and Improvement

MMC Trauma Center staff worked throughout the year to strengthen the response and workflow in MMC's trauma rooms, allowing for efficient and effective care and disposition of trauma

patients. Currently, MMC is focusing on the length of stay in the ED, specifically arrival-to-CT times in under 10 minutes. In tandem with this, MMC is working to strengthen daily multidisciplinary rounds for trauma admissions in order to decrease length of inpatient stay and improve patient satisfaction. MMC is tracking transfers out in an effort to minimize time to discharge, with particular focus on air transfers.

Injury Prevention Programs and Initiatives

MMC promoted distracted driving awareness and falls prevention through participation in statewide injury prevention days. Additionally, MMC trauma staff taught several Stop the Bleed® classes in the community and participated in the statewide Stop the Bleed® Day co-sponsored by all Maryland trauma centers. MMC collaborated with Safe Kids Washington County in providing bicycle, fire, medication, sun, and pedestrian safety education to children in the community through various community initiatives. MMC likewise partnered with local summer camps to discuss general safety with children. In addition to car seat checks and loaner programs, MMC trauma staff offered one-on-one car seat installation assistance to families in the community, teaching parents and grandparents how to properly install child passenger safety seats. MMC offers both virtual and in-person car seat checks.

EMS and Nursing Continuing Education

MMC organized free trauma conferences for staff and EMS partners, and provided trauma nurse core curriculum (TNCC) and emergency nursing pediatric care (ENPC) courses at the hospital. In addition, the trauma department provided Case Reviews for EMS throughout the region. Each spring, the trauma department team recognizes a Trauma Nurse of the Year for his/her outstanding care of patients. The honoree is granted an educational stipend for trauma continuing education. MMC initiated monthly drop-in sessions with Trauma Acute Care Surgery providers to review skills and deliver up-to-date trauma best practice education to all staff that care for MMC's trauma population.

Research

MMC's professional nursing research council studies and promotes evidence-based best practices in nursing. This year, MMC's Trauma Acute Care Surgery team initiated a monthly research meeting and a monthly Journal Club to promote and discuss relevant and recent best practices in trauma care.

Rehabilitation

Meritus Physical Therapy is the region's largest, most comprehensive rehabilitation center, providing care in an inpatient hospital unit as well as an outpatient facility located in the adjacent Robinwood Professional Center. This year, Meritus Health opened a Sports Medicine/Physical Therapy center at the Valley Mall, providing another convenient site for patients to seek care. Meritus Health is the sports-medicine provider of choice for the Flying Boxcars professional baseball team and additionally partners with Washington County Public Schools to provide professional athletic trainers in the county's high schools. The inpatient rehabilitation unit is certified to meet rehabilitation standards set forth by the Commission on Accreditation of Rehabilitation Facilities.

Level III Adult Trauma Center

TidalHealth Peninsula Regional

100 East Carroll Street, Salisbury, Maryland
MIEMSS Region IV

TidalHealth Peninsula Regional is a designated Level III Adult Trauma Center serving the Delmarva Peninsula, the Eastern Shore of Maryland, Sussex County in southern Delaware, and Accomack County on the Eastern Shore of Virginia. TidalHealth encompasses the former Peninsula Regional Health Systems, Nanticoke Memorial Hospital, McCready Memorial, the Peninsula Regional Medical Group, Nanticoke Physician Network, Delmarva Heart, and Peninsula Cardiology. TidalHealth's values of quality, service, and community inform its mission of improving the health of the communities it serves. From June 1, 2023, to May 31, 2024, TidalHealth Peninsula Regional treated 2,668 trauma patients, according to the Maryland State Trauma Registry. The Emergency/Trauma Center provides adult and pediatric trauma services at TidalHealth Peninsula.

Quality Management and Improvement

TidalHealth Peninsula maintains several ongoing quality improvement initiatives. Trauma and emergency department leadership work with the EPIC healthcare software team to improve trauma documentation using the Trauma Narrator, making the EPIC proprietary application more user-friendly for clinicians. This year, TidalHealth Peninsula added a Trauma Vitals Reassessment link, making it more efficient for RNs to document vital signs, assessment/interventions for uncontrolled bleeding, and GCS. The Trauma Alerts for reassessment have been added to the Trauma Narrators and the Emergency Department Narrator. This is triggered by either by chief complaint of Trauma or any trauma activation. Enhancements to the Blood Tracker were made including a balanced resuscitation reminder. Working with clinical staff, a multidisciplinary team works to improve quality metrics such as vital signs, antibiotics for open fractures, time to head CT, and door-to-reversal times for anticoagulated patients with abnormal imaging. Team members receive documentation feedback as needed.

TidalHealth Peninsula continued to hold mandatory trauma simulation sessions, which offer staff an opportunity to provide documentation in the EMR in real time and incorporate the trauma nurse process into practice. The Trauma Committee continues to revise and approve proposed changes to trauma program policies throughout the health system to further develop a consistent, evidence-based approach to providing care to trauma patients.

The EMS Medical Director attended local and regional EMS meetings, providing direction, feedback, and education to local EMS agencies. Additionally, EMS clinicians play an active role in TidalHealth Peninsula's AMI and Stroke Committees.

Injury Prevention Programs and Initiatives

In June 2023, TidalHealth Peninsula provided water safety education in conjunction with Safe Kids at the Maryland State Firefighters Association Convention & Conference. In August 2023, TidalHealth Peninsula provided education on bike safety and distributed ninety helmets, locks, and bells to the community during the National Night Out. To create awareness and behavior modification among caregivers, a heat display was exhibited on campus in September 2023, and TidalHealth Peninsula again delivered bike safety messaging at the annual Children's Christmas Carnival in December, distributing 32 properly fitted helmets. TidalHealth Peninsula provided multiple Stop the Bleed® training sessions for both hospital staff and the community, including the Miss Utility Conference, throughout the year. Trauma/emergency department staff, local fire/EMS personnel attend and/or serve as instructors for these Stop the Bleed® classes.

TidalHealth Peninsula Regional began monitoring the on-scene time for trauma patients that are transported to TidalHealth. This information is broken down by the jurisdictions that primarily transport to TidalHealth's facility – Wicomico, Somerset, Worcester, Salisbury, and Ocean City. The information is shared at the local EMS advisory meeting and posted on the board outside the EMS lounge for clinicians to review. The current average for these areas is 13-14 minutes.

TidalHealth continued to monitor its EMS off-load times. The current median averages eight minutes, with the 90th percentile averaging 17-18 minutes; TidalHealth shares this information with area EMS clinicians.

EMS and Nursing Continuing Education

TidalHealth Peninsula assists in planning, coordinating, and sponsoring regular educational opportunities for prehospital and hospital healthcare clinicians. In September 2023, the annual Topics in Trauma conference drew EMS clinicians and nurses from Maryland, Delaware, Pennsylvania, and Virginia by addressing subjects such as the daily practice of prehospital care and advanced inpatient trauma care. The Trauma Nursing Core Course (TNCC) is mandatory for RN staff; this year, 31 nurses completed the course and received TNCC certification. In addition, TidalHealth Peninsula provided continuing education (including Advanced Life Support, ALS Skills, and Paramedic recertifications/refreshers) to EMS clinicians in Worcester, Wicomico, and Somerset Counties. TidalHealth Peninsula supports the Wor-Wic Community College EMS program by serving as a clinical training site for students. Through this agreement, EMS students have clinical rotation through the various units for a better understanding of how evidence-based practice guidelines apply across the healthcare continuum.

Rehabilitation

TidalHealth Peninsula maintains an in-house rehabilitation program that offers physical, occupational, and speech therapy. TidalHealth offers inpatient skilled nursing care at Alice B. Tawes Nursing & Rehab in Crisfield, Maryland, for those patients recovering from injury. The hospital retains a memorandum of understanding with Encompass Health Rehabilitation Hospital in Salisbury and other appropriate centers to provide care to those who require additional resources and time to recover from traumatic injuries.

Level III Adult Trauma Center

UPMC Western Maryland

12500 Willowbrook Road, Cumberland, Maryland
MIEMSS Region I

UPMC Western Maryland is designated as a Level III Adult Trauma Center serving Allegany and Garrett Counties in Maryland, and neighboring counties in Pennsylvania and West Virginia. UPMC Western Maryland's mission is to serve its community by providing outstanding patient care while shaping tomorrow's health system through clinical and technological innovation, research, and education. UPMC Western Maryland treated 989 trauma patients from June 1, 2023 to May 31, 2024, according to the Maryland State Trauma Registry. Adult trauma services are provided primarily by the Emergency Department.

Quality Management and Improvement

Since becoming a part of the UPMC Hospital Network in February 2020, UPMC Western Maryland has been able to leverage UPMC's innovation and clinical expertise to advance quality initiatives to enhance healthcare services provided to patients in the tristate service region. UPMC Western Maryland is enrolled in the American College of Surgeons Trauma Quality Improvement Program to streamline and benchmark quality. Quality data is utilized to develop policies for the standardization of patient care and improvement of outcomes built upon evidence-based best practice models.

UPMC Western Maryland's multidisciplinary team approach is designed to serve the unique needs of each patient. Staff work diligently to facilitate communication between hospital and prehospital personnel. To support this initiative, in addition to base station, UPMC Western Maryland maintains representation on the Miltenberger Emergency Services Seminar Planning Committee, the MIEMSS Region I EMS Advisory Council, the Maryland Trauma Center Network, Maryland EMS Protocol Revision Team for Trauma, Allegany County Emergency Services Board, Allegany County Emergency Services Quality Assurance Review Board, Allegany County Medical Review Board, Maryland Regions I & II Healthcare Council, and the MIEMSS Region I Prehospital Care and Quality Improvement Committee.

Injury Prevention Programs and Initiatives

In conjunction with the Allegany County Department of Emergency Services and the Garrett County Department of Public Safety, UPMC Western Maryland provides instructional support for the Stop the Bleed ® program for courses being taught to Fire/Rescue personnel and EMS clinicians, law enforcement officers, and citizens throughout MIEMSS Region I and bordering counties in Pennsylvania and West Virginia. UPMC Western Maryland participates in the Maryland Kids in Safety Seats program to help provide a safe ride for the region's children. Additionally, UPMC Western Maryland networks with Maryland EMS for Children and Safe Kids Maryland by participating in the Bike Safety Project to provide bicycle helmets to the public while delivering education on correct helmet use in an effort to reduce the number of significant head-injury deaths in Maryland due to bike crashes.

EMS and Nursing Continuing Education

UPMC Western Maryland is the continuing education hub for MIEMSS Region I, offering continuing education credits in a variety of subjects, including trauma. The Training Center and Professional Development team at UPMC Western Maryland provide intermediate and advanced training through courses in Advanced Cardiac Life Support, Pediatric Advanced Life Support, Neonatal Advanced Life Support, Basic Trauma Nursing, and the Trauma Nursing Core Course while actively participating in the planning, production, and implementation of the annual Miltenberger Emergency Services Seminar. UPMC Western Maryland serves as a clinical site for Garrett College's Paramedic Studies program as well as the paramedic program administered by Blue Ridge Community and Technical College in West Virginia, and Indiana University of Pennsylvania. UPMC Western Maryland opened a simulation lab equipped with three state-of-the-art simulation patient manikins in spring 2022. Since then, UPMC Western Maryland has teamed with the University of Pittsburgh's WISER Institute to provide continuing education opportunities to hundreds of staff and non-employee learners. As always, educational offerings at UPMC Western Maryland are intended for physicians, nurses, technicians and unit assistants, EMS clinicians, and countless others within the multidisciplinary patient care team.

Rehabilitation

The 13-bed Comprehensive Inpatient Rehabilitation Unit (CIRU) located at UPMC Western Maryland provides rehabilitation services to its trauma patients. Although each patient's needs are unique, the mission of the CIRU is to improve ability for self-care, mobility, and communication while working to reduce limitations and promote wellness and self-worth. The CIRU develops a plan for care beyond the inpatient rehabilitation stay and helps patients return to their homes and communities.

Out-of-State Adult Trauma Centers

ChristianaCare Level I Adult Trauma Center – Newark Campus

4755 Ogletown-Stanton Rd., Newark, Delaware

ChristianaCare Level I Trauma Center is the only Level I Adult Trauma Center in the state of Delaware, as well as the only Level I Adult Trauma Center along the I-95 corridor between Philadelphia, Pennsylvania, and Baltimore, Maryland. It serves as the regional referral center for a catchment area that includes the entire state of Delaware, Southern Chester County (Pennsylvania), Salem County (New Jersey), and Cecil County in northeastern Maryland.

As an American College of Surgeons-verified Level I Adult Trauma Center, Christiana Hospital has the capability for the care and treatment of traumatically injured patients at all levels of acuity, including those who are critically injured. From July 1, 2023, through June 30, 2024, it treated ~ 5,000 patients, with ~ 3,700 (74%) being admitted for trauma care. Of those admitted, ~14% were Maryland residents.

MedStar Washington Hospital Center

110 Irving Street, NW, Washington, DC

MedStar Washington Hospital Center delivers exceptional patient-first health care by providing the highest quality and latest medical advances through excellence in patient care, education, and research. The MedSTAR (Medical Shock/Trauma Acute Resuscitation) Trauma Unit at MedStar Washington Hospital Center is the regional referral center for critical multiple trauma, treating individual victims of traumatic injury and multiple victims of mass trauma occurrences. Located in the heart of the nation's capital, the Center has responded to thousands of medical crises, including treating patients of the September 11, 2001, terrorist attack on the Pentagon, victims of the Navy Yard shootings in 2013, and the active assailant attack on the Congressional Baseball Game for Charity in 2017.

Verified by the American College of Surgeons as a Level I Facility, MedSTAR serves as a referral center for a 150-mile radius of the hospital, receiving critical trauma patients from the District of Columbia, Maryland, Virginia, Delaware, and Pennsylvania. It provides both air and ground transport via MedSTAR Transport, bringing in patients from referring hospitals and from the site of injury. This year, MedSTAR treated 2,401 trauma patients.

Adult Burn Center

Johns Hopkins Bayview Medical Center

4940 Eastern Avenue, Baltimore, Maryland
MIEMSS Region III

The Burn Center at Johns Hopkins Bayview Medical Center (JHBMC) serves the residents of Maryland and specific regions of adjacent states by providing a comprehensive, nationally recognized program of care for patients with burn injuries. This year, JHBMC treated 760 patients (319 inpatients and 441 patients), either in the emergency room or under observation.

JHBMC advanced the science of burn care with peer-reviewed publications on a wide variety of burn topics, including resuscitation, skin substitutes, and wound healing. In addition, the JHBMC Burn Center's robust quality and performance improvement program has begun publishing its findings. Research projects include exploration of the impact of sleep on burn pain, early ambulation following skin grafting, and the experience of pain after childhood adversity.

JHBMC supported vital programs rooted in evidence-based practice. These included current initiatives directed at better serving the Burn Center's patients include quality improvement programs to decrease hospital-acquired infections, decrease pain, improve functional outcomes of burn patients, and improve fluid resuscitation in large burns. JHBMC likewise played a vital role in providing burn care education to prehospital and hospital-based clinicians, including students.

The JHBMC Burn Center remains verified by the American Burn Association. This distinction affirms that the Burn Center has met the highest standards of care for the burn-injured patient.

Quality Management and Improvement

JHBMC has developed and maintained a system for tracking and responding to a variety of quality improvement metrics, including time from scene to initial presentation and throughput time from emergency department to admission. In addition, the Burn Center works closely with the base station to identify communication and transport problems in near-real time. Additional metrics tracked include time to initiation of tube feedings, incidence and prevalence of compartment syndrome, and development of adult respiratory distress syndrome (ARDS). These metrics are reported and discussed monthly in a multi-disciplinary Joint Practice Committee. Executive leadership support of this program resulted in the creation of a new tableau dashboard for near real-time tracking of these identified areas of interest.

Injury Prevention Programs and Initiatives

JHBMC designs, leads, and implements community outreach and education in a variety of ways. Educational offerings have included presentations in the Johns Hopkins Health Systems Pain Resource Program, the Johns Hopkins Occupational Therapy Hand and Acute Fellowship Program, and schools of nursing. The Johns Hopkins Bayview Medical Center continues to host annual Topics in EMS conferences. The Burn Center offers Advanced Burn Life Support courses to its internal and external staff, as well as prehospital clinicians. This year, community outreach activities included statewide health and safety fairs and programs in burn prevention. Outreach activities with burn survivors continued with participation in the Phoenix Society for Burn Survivors, the World Burn Congress, and Survivors Offering Assistance in Recovery (SOAR). This year, the Johns Hopkins Burn Center sent a record number of survivors, their families, and staff to the World Burn Congress, where they participated in life-changing activities designed around a shared vision for thriving in survivorship.

A new partnership with the Baltimore Firefighters' Burn Foundation has provided advanced opportunities for community engagement with survivors and firefighters. As part of these initiatives to better understand the etiology of firefighter injuries, the Burn Center team participated in a live training with the firefighters. The training afforded frontline burn center staff and leaders to don firefighter protective equipment and enter a building during a controlled fire. This opportunity afforded staff members unique perspective on how firefighter injuries occur and how the Burn Center can optimally manage these injuries.

EMS and Nursing Continuing Education

JHBMC provides clinical education at local nursing schools. The Burn Center cycles EMS students through clinical rotations and coordinates biannual prehospital and clinical educational opportunities, including Advanced Burn Life Support. In addition, JHBMC offers an EMS/Firefighter Burn Course for prehospital clinicians throughout the region, and participates in annual Emergency Medical Technician ALS updates in many Maryland counties. JHBMC delivers frequent lectures at EMS Regional Conferences as well as outside hospital conferences and lectures throughout the region upon request. On-site clinical training for medical, nursing, rehabilitation, psychology, and dietician students continued throughout the year. Additionally, the Burn Center provides educational presentations at many colleges and universities throughout the region for various health disciplines, including prehospital clinicians.

Research

The Burn Center continued to collaborate with multiple disciplines, including physical and occupational therapy, critical care, nursing, infectious disease, palliative care, and psychology, to investigate complex, multi-disciplinary research questions. It participates in sponsored clinical trials, federally funded multicenter trials, and investigator-initiated research. The Michael D. Hendrix Burn Research Laboratory actively studies the non-healing wound environment in animal models, and looks at ways to improve burn wound healing. JHBMC's research this year included the utilization of social media during COVID-19; pressure mapping to prevent pressure injuries; risk factors for cooking injuries; opioid dependence in burn survivors; antibiotic

prophylaxis; and the management of weight changes during acute hospitalization. The Burn Center publishes and presents its findings at various local, regional, and national conferences.

Fellowships/Residencies

For over 20 years, the Johns Hopkins Burn Center has provided annual fellowship training for physicians in both general and plastic surgery tracks. In addition, the Johns Hopkins Burn Center provides an ACGME accredited burn and critical care fellowship. The Burn Center also provides residency training in partnership with local hospitals and universities, including Johns Hopkins University, ChristianaCare Health System, MedStar Union Memorial Hospital, St. Agnes Hospital, Hershey Medical Center, and Sinai Hospital.

Rehabilitation

The Johns Hopkins Burn Rehabilitation Department is dedicated to rehabilitating burn survivors. Every patient admitted to the Burn Center is seen by PT/OT within the first 24 hours. This year, the Burn Center evaluated 319 inpatients. Burn inpatients are treated on a daily basis in the Burn Center's on-site burn rehabilitation gym or in their rooms, depending upon the patient's condition. The burn therapists at the Burn Center represent the nation's best, serving in leadership roles in the American Burn Association and as participants in a multi-center research study investigating early ambulation in burn patients. The Rehabilitation Department continued to work with case management and social workers to discharge patients to appropriate levels of care. The Burn Center maintains a close working relationship with the Johns Hopkins Specialty Hospital for inpatient rehabilitation. The Burn Center works to actively improve the continuum of care by discussing each burn patient and consultation at weekly multi-disciplinary conferences. These meetings enable the Burn Center to better plan patient discharges with a dedicated burn case manager and dedicated licensed clinical social worker. The Burn Center was able to create a new outpatient physician assistant position and attending physician role with executive-level support. The addition of these positions allows for additional clinic days and visits. Consequently, the Burn Center is able to closely follow its patients following discharge.

Adult Burn Center

MedStar Washington Hospital Center

110 Irving Street, NW, Washington, DC

The Burn Center at MedStar Washington Hospital Center (MedStar WHC) is the only adult burn treatment center in the Washington Metropolitan area, serving the District, Southern Maryland, Northern Virginia, and Eastern West Virginia. In addition to providing care to patients with thermal, electrical, and chemical injuries, MedStar WHC Burn Center treats patients with soft-tissue injuries and diagnoses. This year, 616 acute burn-injured patients were admitted for treatment, with another 858 treated as outpatients. The Burn Center provided outpatient burn care for 2,554 patients in the Burn Clinic and 2,281 patients in the Wound Clinic.

The Burn Center features a 10-bed ICU with its own operating room and tanking room, as well as a 23-bed Burn Step-Down Unit and a Burn Rehabilitation Gym staffed by specialized Burn Physical and Occupational Rehabilitation Therapists. Reconstructive surgery and rehabilitation are available for patients in the post-acute and convalescent phases of their care, regardless of where they received treatment for their acute burn injury.

The Burn Center meets stringent criteria for verification by the American Burn Association for providing excellence in burn care. Its multidisciplinary team approach to burn care provides comprehensive services for patients from injury through rehabilitation. The Burn Center is a national leader in laser scar revision, with a practice dedicated to patients with burn and traumatic injuries. For patients suffering from pain, itching, tightness, and discoloration associated with burn or traumatic scars, the Burn Center offers multiple interventions, including compression and massage, laser scar revision, and surgical reconstruction.

The Burn Center began complete renovations of its inpatient and outpatient clinical spaces. This renovation began in December 2023 with the Burn ICU and the Burn Operating Room. The next phase of the project will include renovations of the Burn Step-Down Unit, Burn Rehabilitation Gym, and Burn Clinic. This second phase of renovations should begin in early-2025.

Pediatric Trauma and Burn Centers

Johns Hopkins Children's Center

1800 Orleans Street, Baltimore, Maryland
MIEMSS Region III

JHCC Pediatric Trauma Center

The Johns Hopkins Children's Center (JHCC) is the designated Level I Pediatric Trauma Center serving Maryland and the surrounding region. The 205-bed, state-of-the-art hospital features an expansive pediatric emergency department equipped with dedicated pediatric trauma resuscitation bays, a 28-bed Pediatric Intensive Care Unit (PICU), and a pediatric operative suite with designated emergency operating rooms for pediatric trauma patients. From June 1, 2023, through May 31, 2024, JHCC treated over 1,000 trauma-injured children, according to the Maryland State Trauma Registry.

This year, The Johns Hopkins Hospital received its fifth Magnet Designation from the American Nurses Credentialing Center, a healthcare organization's highest and most prestigious nursing designation, signifying innovation, excellence, and quality-driven patient care. JHCC remains US News & World Report's No. 1-ranked children's hospital in Maryland, and among the Top 10 in the nation, with 10 pediatric specialties nationally ranked.
Johns Hopkins Pediatric Transport helped arrange the interfacility

transfers of more than 800 trauma and burn patients from regional hospitals to JHCC. The JHCC Trauma team launched a quarterly collaborative meeting with multidisciplinary stakeholders from across the organization. These collaborative sessions drive discussion of ongoing initiatives from disciplines across JHCC, help to identify new research opportunities, and reinforce the shared mission of the trauma program.

Quality Management and Improvement

JHCC's pediatric trauma program ended the fiscal year with its highest volume of patients to date. The program's multidisciplinary Performance Improvement (PI) Committee meets monthly to review trauma statistics and other relevant data to increase transparency and identify areas for improvement in a timely, collaborative fashion. These statistics are compared over months and years to identify trends. All emergency department visits for traumatic injuries are reviewed for quality, and the patient charts are audited until discharge.

The JHCC Pediatric Base Station's active quality improvement (QI) plan ensures regular evaluation of the online medical direction provided to EMS clinicians, who give formal and informal feedback to jurisdictional QI officers. Integration with EMS stakeholders and the pediatric trauma team occurs in the monthly multidisciplinary process improvement and morbidity and mortality conferences, facilitating partnership in the healthcare continuum. Additionally, JHCC introduced a new initiative to start whole blood transfusion in pediatric patients, enhancing the trauma care provided.

Injury Prevention Programs and Initiatives

The JHCC Injury Prevention Program (IPP) is a collaborative effort across the Children's Center. This year, the IPP continued its collaboration with Safe Kids Baltimore and Safe Kids Maryland, the Injury Free Coalition for Kids, the Childhood Injury Prevention Network (JHCC and the Johns Hopkins School of Public Health), JHCC multidisciplinary burn and trauma groups, the Johns Hopkins Safe Sleep Group, the JHM Trauma and Injury Prevention Collaboratives, Maryland TraumaNet, and the Maryland Committee on Trauma. Child passenger safety technicians (CPSTs) provided car seat fittings to patients, assisted with on-site installations, and participated in local community seat checks as well as the JHCC Car Seat Check.

The IPP partnered with Adult Trauma to host Stop the Bleed® classes and Trauma Survivors Day; shared the MIEMSS Safe Sleep Display with NICU and pediatric emergency department parents for Safe Sleep Month; assisted with trauma outreach to local hospitals through the Johns Hopkins Trauma Program; and continued to provide education internally to JHCC staff. The IPP launched a new collaboration with our Child Life Program by hosting a monthly injury prevention segment for patients on the internal TV channel. In addition, the program broadened its social media presence with the JHCC Social Media team.

This year, the IPP hosted multiple Stop the Bleed® classes for students, employees, and school staff, including a course at Mercy High School and Johns Hopkins University. The IPP attended multiple health fairs and schools to educate on bike and pedestrian safety, including the Harford County Hispanic Heritage Health Fair, Patterson Park's Día del Niño, Oakleigh Elementary School, and Hampstead Hill Academy. On National Injury Prevention Day, the IPP recognized the day by hosting an Injury Prevention table at Port Discovery Children's Museum and partnered with local landmarks to "Shine a Green Light". In collaboration with All Children's, the IPP created a "Bike & Pedestrian Safety Tips" video on how to be safe bikers and walkers.

Interdisciplinary Pediatric Trauma Bootcamp/Course for Fellows
Designed to enhance the performance of the pediatric trauma team, the Interdisciplinary Pediatric Trauma Bootcamp emphasizes evidence-based trauma management and procedural training skills. The course supports the improvement of pediatric trauma team dynamics during pediatric trauma activations. Curriculum development for this course places specific emphasis on ATLS implementation in the trauma bay and highlights the unique features of pediatric care. The intentional multidisciplinary instruction underscores the necessary collaboration between teams during trauma events. This year, the course included learners from the Pediatrics, General Surgery, and Emergency Medicine residency programs, and fellows from the Pediatric Intensive Care and Pediatric Surgery programs.

EMS and Nursing Continuing Education

JHCC offered prehospital clinicians and students monthly training, including lectures, case reviews, and simulations throughout the year. Maryland State Police paramedics trained alongside pediatric anesthesiologists in the operating room to maintain comprehensive pediatric airway management competency. Trauma staff provided ongoing education and case reviews to referring facilities.

The Johns Hopkins Simulation Center, a fully accredited, state-of-the-art training facility incorporating standardized patients and teaching associates, human patient simulation, virtual reality, task trainers, and computerized simulation, helped clinicians with trauma education and preparedness. The Pediatric Base Station provided online medical direction to EMS clinicians with an active QI plan for evaluation and feedback. Every six months, JHCC provides pediatric content for refresher classes for Baltimore City paramedics, consisting of seven hours of continuing education. Physicians from all subspecialty areas provided continuing education for Maryland prehospital clinicians at annual EMS conferences across the state.

JHCC developed an online base station course specific for those caring for children of all ages (birth to 18/21). Facilitating this 90-minute online course and quiz offers flexibility for staff to complete the Pediatric Base Station Course, which is required by MIEMSS and the Maryland Board of Nursing.

JHCC has an active contract with the University of Maryland

Baltimore County, Baltimore City Community College, Howard County Fire and Rescue Services, and the Community College of Baltimore County's Paramedic program within the pediatric emergency department. Students participate in assessments and vital signs and attend traumas in an observational role. Additionally, through the pediatric emergency department, JHCC hosts military-based Center for the Sustainment of Trauma and Readiness Skills (C-STARS) personnel preparing for active deployment.

Fellowships and Residencies

Johns Hopkins Pediatric Surgery has an Accreditation Council for Graduate Medical Education-approved two-year fellowship program. After a competitive process, one fellow per year enters the program, allowing a junior and senior fellow to train concurrently. Under the direction of the general pediatric surgery attending, the fellows are responsible for managing all trauma and burn patients at JHCC. Additionally, a collaboration with the University of Maryland Medical Center allows for a three-month rotation at UMMS.

Research

Members of the JHCC Pediatric Trauma Program are involved in several innovative research projects spanning from clinical outcomes and injury prevention to basic science research. These include but are not limited to: a National Institutes of Health-funded, multi-institutional, five-year study that tackles the critical issue of drug and alcohol abuse in the pediatric trauma population; a multidisciplinary study of the neuroinflammatory pathways involved in pediatric traumatic brain injury, extending standard trauma research from the bedside into the laboratory; examination of the adherence to a trauma checklist during our highest trauma activations; evaluation of the association of elevated white blood cell count and other clinically significant inflammatory markers in pediatric trauma patients; and a study of the risk factors for trauma recidivists, including firearm injuries and non-accidental trauma.

Rehabilitation

JHCC's state-of-the-art pediatric rehabilitation program offers inpatient rehabilitation and comprehensive outpatient services. The hospital collaborates with Mount Washington Pediatric Hospital (MWPH) for burn patients needing continual inpatient rehabilitation. Accreditation for MWPH is by the Joint Commission and the Commission on Accreditation of Rehabilitation Facilities for the hospital's Comprehensive Integrated Inpatient Rehabilitation Program with a Pediatric Specialty Program. The pediatric rehabilitation programs also collaborate with providers across the state for patients who cannot commute to JHCC for continued care after discharge.

JHCC Pediatric Burn Center

The Johns Hopkins Children's Center (JHCC) is verified by the American Burn Association (ABA) and designated by MIEMSS as a Level I Pediatric Burn Center. JHCC was re-verified through the ABA in FY 2024 and will be due to reverify in early-2025. The JHCC burn team treated 418 burn-injured children in their burn center, and treated 470 children in the burn clinic from June 1, 2023 through May 31, 2024, according to the Maryland State Trauma Registry. Johns Hopkins Pediatric helped to arrange transport of over 160 pediatric burn patients from hospitals across Maryland to JHCC.

In the past year, the Burn Program expanded its clinical capacity by increasing its multi-disciplinary clinics to twice a week, as well as by offering additional ad hoc appointments for wound checks, as needed. JHCC continued to host monthly leadership meetings and quarterly multidisciplinary meetings with stakeholders from across the hospital to further the collaborative patient care and research efforts that comprise the heart of the burn program. This year, the burn program expanded efforts beyond the walls of JHCC, presenting numerous education events for regional hospitals, EMS and firefighter teams, and the public. In addition, the pediatric burn program continues to bolster its relationship with its adult counterpart (also housed at the Bayview campus) through case discussions, increased involvement of the burn fellows in the care of our pediatric patients, and development of a new Burn Foundation with the Baltimore Fire Department.

Quality Management and Improvement

The Pediatric Burn Performance Improvement (PI) Committee is a multidisciplinary team focused on the overall programmatic PI. The PI team reviews performance metrics and data trends, and existing policies and assesses and implements new regulatory requirements and recommendations. The committee develops, tracks, and implements action plans stemming from morbidity and mortality review, and develops and tracks the implementation of additional action plans raised by data trends and committee members. It compiles burn statistics in monthly reports and compares current metrics with those of the previous months to evaluate trends. All emergency department visits for burn injuries are reviewed for quality, and all burn patient charts are audited until discharge.

Established in 2016, the Pediatric Injury Quality Improvement Collaborative (PIQIC) initiative provides a forum where pediatric trauma and burn specialists form JHCC and four other pediatric burn centers network and share knowledge and best practices in treating pediatric burn patients. Each program contributes to a centrally administered database allowing for benchmarking, development of best practice guidelines, and collaborative research.
Jurisdictional quality improvement (QI) officers review EMS feedback regarding the online medical direction provided by the Pediatric Base Station to EMS clinicians. Integration with EMS stakeholders and the pediatric burn team occurs in the monthly multi-disciplinary process improvement and morbidity and mortality conferences as partners in the healthcare continuum.

Pediatric Psychology

Pediatric psychology is integral to the pediatric burn team,

providing inpatient and outpatient clinical services to patients and their families. The team screens patients and their families using standardized instruments to assess the child's quality of life and overall child and parent distress. Interventions, such as coping mechanisms during stressful experiences, support optimal adherence to medical recommendations and patient and family recovery. A dedicated burn psychologist at JHCC leads efforts to collaborate with other pediatric burn centers through Pediatric Injury Quality Improvement Consortium (PIQIC) for establishing psychosocial PI metrics and best practices. Through JHCC's involvement in PIQIC, the implementation of the JHCC-developed standard psychology screening protocol is now in use across multiple centers across the Country. JHCC anticipates publishing the results of its implementation soon.

Injury Prevention Programs and Initiatives

JHCC's Injury Prevention Program (IPP) provides services to patients, families, community, and staff. This year, these efforts included media interviews on the topics of summer safety and Halloween safety, general prevention tips at community invents including the Bmore Healthy Babies Event, and injury prevention education at local elementary schools. The IPP collaborated with the Baltimore City Firefighters Burn Foundation and the Johns Hopkins Bayview Burn Program to host a Burn Survivors Holiday Celebration and a burn/fire prevention segment on Child Life TV. The IPP is currently working to develop a library of evergreen materials targeting different ages and audiences to be used by JHCC's team as well as other groups (e.g., Baltimore Fire Department members) for use across the city and the region.

EMS and Nursing Continuing Education

The JHCC burn team provides burn education to referring hospitals, typically focused on evaluating and managing injuries. This year, it provided closed-loop feedback to referring hospitals through case-review offerings and CME burn education. In addition, the JHCC burn team offered monthly training to prehospital clinicians and students, including lectures, case reviews, and simulation. Maryland State Police paramedics train alongside pediatric anesthesiologists in the operating room to maintain comprehensive pediatric airway management competency. The burn team participates in annual JHCC pediatric nursing forums and education/simulation sessions with the Johns Hopkins Pediatric Transport Team.

Fellowships and Residencies

Johns Hopkins Pediatric Surgery has an Accreditation Council for Graduate Medical Education (ACGME) approved two-year fellowship program. After a competitive process, one fellow per year enters the program, allowing a junior and senior fellow to train concurrently. Under the direction of the general pediatric surgery attending, the fellows are responsible for managing all trauma and burn patients at JHCC. In addition, the Bayview Adult Burn Program Fellowship program, hosting up to three fellows per year. With our enhanced collaboration with the adult program, the fellows are now welcome to join our team and learn the nuances of pediatric burn care.

The pediatric psychology fellowship program includes training with burn patients. A psychology fellow and/or attending physician meets all burn patients while inpatient. Additionally, a burn fellow and/or attending physician staff our outpatient clinic.
Designed to enhance the performance of the pediatric trauma team, the Interdisciplinary Pediatric Trauma Bootcamp emphasizes evidence-based trauma management and procedural training skills. The course supports the enhancement of pediatric trauma team dynamics during pediatric trauma activations. The curriculum development for this course places specific emphasis on ATLS implementation in the trauma bay and highlights the unique features of pediatric care. The intentional multidisciplinary instruction emphasizes the necessary collaboration between teams during trauma events. This year, the course included learners from the Pediatrics, General Surgery and Emergency Medicine Residency programs and fellows from the Pediatric Intensive Care and Pediatric Surgery Programs.

Research

The JHCC pediatric burn staff served as session panelists/content experts at several national meetings and published several manuscripts in peer-reviewed journals. Current research initiatives include evaluating child quality of life and parent PTSD and depression symptoms following pediatric burn injury; parent perceptions of the pediatric burn healing process and the need for support; drug and alcohol screening in teens; epidemiology of hot beverage scalds in children; attrition between emergency department care and outpatient clinic visits; and follow-up compliance of burn patients during the COVID-19 pandemic.

Rehabilitation Services

JHCC's state-of-the-art pediatric rehabilitation program offers inpatient rehabilitation and comprehensive outpatient services. The hospital collaborates with Mount Washington Pediatric Hospital (MWPH) for burn patients needing continual inpatient rehabilitation. Accreditation for MWPH is by the Joint Commission and he Commission on Accreditation of Rehabilitation Facilities for the hospital's Comprehensive Integrated Inpatient Rehabilitation Program with a Pediatric Specialty Program. In addition, the pediatric rehabilitation program collaborates with providers across the state for patients unable to commute to JHCC for continued post-discharge care.

Children's National Hospital

111 Michigan Avenue, NW, Washington, DC

CNH Pediatric Trauma Center

Children's National Hospital (CNH) is designated as a Pediatric Trauma and Burn Center by MIEMSS. CNH serves Washington, DC, surrounding Maryland Counties, and parts of Southern

Maryland. CNH's pediatric trauma services are provided by the Division of Emergency Trauma and Burn Surgery. This year, CNH treated 1,401 trauma-injured children, of which 62% were residents of Maryland. CNH treated 502 injured children in the Trauma Code Room and admitted 586 children. CNH has continued to improve the availability of blood products for immediate use in the Emergency Department and Intensive Care Units as well as improve efficiency in the care of the penetrating injured child as the incidence of pediatric penetrating injury has increased by 7%.

Quality Management and Improvement

CNH implemented mental health screening and treatment of injured patients and their families thanks to a donation that provided a dedicated social worker, child life therapist and a burn nursing coordinator. This has allowed for the design of detailed care programs that prevent long-term symptoms and address Post Traumatic Stress Syndrome (PTSD), as well as the creation of a storybook template to aid in the education and comprehension of children working through the trauma process while maintaining a focus on mental health.

CNH Pediatric Trauma Center's quality improvement program includes periodic submissions to the Pediatric Trauma Quality Improvement Program (TQIP) to support the American College of Surgeons Committee on Trauma's initiatives. The TQIP provides adjusted benchmarking for pediatric trauma centers to track outcomes and improve patient care. The data is used to nationally benchmark and evaluate patient care.

CNH improved resource availability to all staff caring for trauma patients through the development of a phone application. The CN Trauma phone app is available to all nurses, physicians, and ancillary staff caring for the trauma patient. This app is specific to the care of the CNH pediatric trauma patient, offering quick access to all policies, procedures, and guidelines, as well as tips and tricks for success.

Injury Prevention Programs and Initiatives

Firearm-related injuries are now the top cause of death in patients aged 24-years-old and under in the United States. This year, CNH cared for a higher-than-average incidence of children with gunshot injuries, taking the incidence from 2.7% of trauma activations in 2017 to 8% of trauma activations. Falls continue to be the leading cause of injury, with approximately 42% of trauma volume attributed to fall injuries. In response, the hospital's Violence Intervention Team, initiated in FY 2023, has been integral in the care of the patient with a penetrating injury. The Violence Intervention Team focuses on interrupting violence in the community by building relationships with violent offenders and providing them with services and resources that address the underlying causes of violence.

EMS and Nursing Continuing Education

The Trauma Service partnered with the Emergency Department to co-host monthly case studies in a hybrid format for Prince George's County EMS. Cases identified through CNH's Performance Improvement and Patient Safety Program were customized for EMS clinicians. These specialized sessions were awarded EMS credit for educational units (CEUs) for all clinicians. CNH's Trauma Center provided further opportunities for CEUs with live and recorded trauma education for nurses, physicians, and paramedics. In addition, CNH provided additional sessions on child abuse to a total of 100 unique EMS and Nursing learners.

Research

The Trauma Research Team, in collaboration with Drexel and Rutgers University, have two major grants, Build an Intention-aware Recommender System for Improving Trauma Resuscitation Outcomes and a National Science Foundation (NSF) grant to Recognize Activities to Reduce Delays in Fast-Response Teamwork. There have been four research papers accepted and published by Trauma Surgery Service clinicians. CNH research provides results that improve pediatric trauma care.

CNH Pediatric Burn Center

The Children's National Hospital (CNH) Pediatric Burn Center serves Washington, DC; multiple counties within Maryland, including Montgomery and Prince George's; Southern Maryland, and certain regions of adjacent states. This year, CNH treated 1,204 burn-injured children, 524 of whom reside in Maryland. Of the 1,747 burn-injured children, 97 were admitted and 470 were emergency department visits. There were an additional 1,579 burn clinic visits. Pediatric burn services at CNH are provided by the Division of Trauma and Burn Surgery.

CNH expanded its mental health care for burn-injured patients. The Burn Team focuses on the mental health of the child and family after a burn-injury event. It triages care, matching patients to the level of mental health care they need to prevent long-term symptoms. To date, the Burn Team has implemented PTSD screening for patients and families starting with patients admitted to the hospital and continuing through the burn treatment plan. It created a storybook template for patients and children to help work through the healing process, and began a school reintegration program.

Quality Management and Improvement

The Pediatric Burn Center's quality improvement program includes daily review of care for inpatient acute burns and weekly multidisciplinary review and care planning for active patients (inpatient and outpatient) with complex wound treatment, risk for scarring/contractures, psychological needs, or other complexities in care. This year, CNH worked to improve the nutritional health of the admitted burn patient. This multidisciplinary improvement focused on continuing nutrition through sedated dressing changes and operative procedures. The enhanced nutritional support promotes burn wound healing. This multidisciplinary project culminated with a new protocol that is available at the fingertips of providers through the CNH Trauma phone app. CNH is one of five charter members of the Pediatric Injury Quality

Improvement Consortium, which, with the backing of one year of data, has implemented five pediatric burn benchmarks. This data will assist in the development of best practice protocols in burn care and contribute to multicenter research in burn management.

Injury Prevention Programs and Initiatives

Burn prevention remains a top priority for CNH. In FY 2021, CNH produced a social media campaign consisting of a burn prevention video series produced with funding from DC firefighters. This campaign enabled CNH to target areas within the catchment with a high number of burn patients. These efforts continued into FY 2024, funded by an intramural grant of $20,000. Since 2021, the video series has reached more 500,000 individuals, 225,000 of whom viewed the videos through to completion.

EMS and Nursing Continuing Education

This year, CNH offered over 50 hours in virtual and in-person continuing education. Virtual burn education is offered through the Trauma and Burn YouTube channel. The site, which contains both recorded didactic education as well as a burn podcast (Burncast) is accessible to internal staff as well as external audiences. To date, CNH has produced over 20 Burncasts covering various burn care-related topics of interest to those caring for burn patients, including the mental health needs of a family post-burn injury, school re-entry, and OR interventions of the burn wound. In addition, virtual education has enabled CNH to expand its outreach and educational opportunities. Children's Burn Service, in partnership with the Children's Emergency Department, has developed monthly education for multiple EMS departments in Maryland, featuring content tailored to the specific needs of the EMS agency and patient situations encountered.

Research

The Burn Center maintains an active research program with multi-year studies in place. Through funds received from the National Institutes of Health and the Agency for Healthcare Research and Quality, the Burn Center continues to research automatic workflow capture and analysis using real-time, data-driven feedback to improve trauma resuscitation outcomes and trauma patient safety. Funded by the Lambert Foundation Award, the burn service is able to study methods to screen for young child hyperactivity and impulsivity with unintentional burn injuries with the intent to develop interventions for parents to prevent burn injury. Multiple presentations at the American Burn Association national meeting highlighted this work. Additionally, the burn team has published peer review articles on parent resiliency and parent traumatic stress after a burn injury.

Rehabilitation

The Department of Physical Medicine and Rehabilitation at CNH consists of three divisions: Pediatric Rehabilitation Medicine, Physical Therapy, and Occupational Therapy. Physicians, advanced practice nurses (APN), registered nurses, physical therapists, occupational therapists, and rehabilitation aides deliver interdisciplinary care to patients at the National Center for Children's Rehabilitation (acute inpatient medical care) and Children's National Hospital, as well as regional outpatient centers (outpatient medical care). Physicians and APNs also provide consultation services in integrated equipment at a bracing clinic and a subacute rehabilitation facility. Children with burns are evaluated and treated by a dedicated OT/PT team during the inpatient stay, extending to the outpatient phase of care. The OT/PT team is available at both the main campus and the Friendship Heights campus to encompass compression measurement and evaluation. Laser therapy is available through the burn service for burn patients in the subacute phase of care to minimize pigment changes and increase skin flexibility.

Specialty Adult & Pediatric Eye Trauma Center

Wilmer Eye Institute at The Johns Hopkins Hospital

1800 Orleans Street, Baltimore, Maryland
MIEMSS Region III

Based at The Johns Hopkins Hospital (JHH) in East Baltimore, Wilmer Eye Institute's Eye Trauma Center (ETC) is uniquely designated for and specialized in the diagnosis, treatment, and long-term management of ocular trauma. Founded in 1925, Wilmer is among the largest and top-ranked academic departments of ophthalmology in the United States.

The Wilmer ETC gathers the finest scientific evidence to promote improved ophthalmic care and the reduction of visual disability in a collaborative environment that combines compassionate patient care, innovative research, and the training of future leaders in ophthalmology and visual sciences. Its faculty, staff, and trainees collaborate with JHH adult and pediatric emergency departments and care teams across the enterprise to meet the comprehensive care needs of patient populations both within and outside of Maryland. Dedicated eye treatment rooms, operating rooms, diagnostic and procedural equipment and supplies; Pharmacy, Radiology, and Pathology support services; and on-call coverage in every subspecialty ensure that patients are treated at the highest standard of care, 24 hours per day.

The Wilmer team is composed of 170+ full-time faculty members and more than 600 staff members working across nine locations in Maryland. This year, the Wilmer clinical practice supported 280,000 patient visits and over 15,000 eye surgeries.

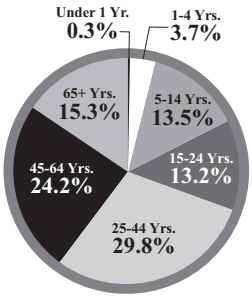
Patient populations include neonates, pediatrics, adolescents, adults, and geriatrics. Core clinical areas of expertise include comprehensive eye care (medical, optometric, and optical services); cornea; glaucoma; laser vision correction; vision rehabilitation; neuro-ophthalmology; ocular immunology; ocular oncology; oculoplastics; pediatric ophthalmology and adult strabismus; retina; and traumatic eye injury. Consistent with prior

Wilmer Eye Institute at The Johns Hopkins Hospital Demographics

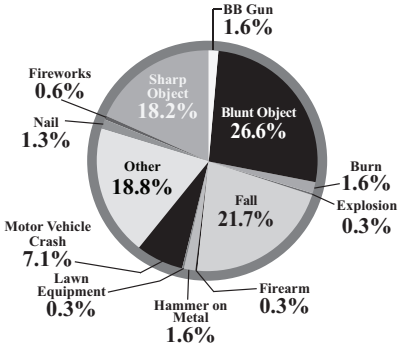
(June 2023 to May 2024), n=326

Source: Maryland Eye Trauma Registry

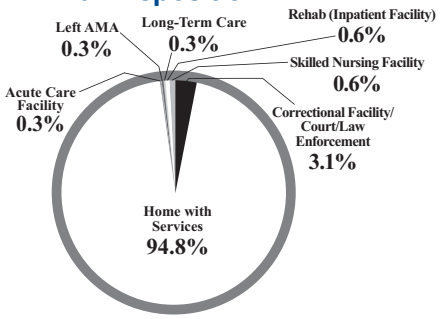
Age



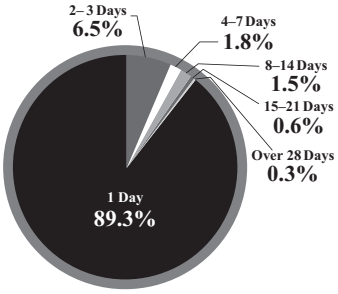
Injury Type



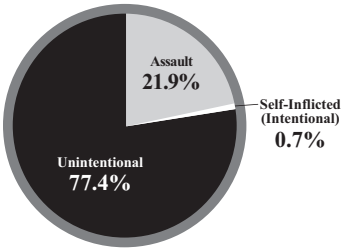
Final Disposition



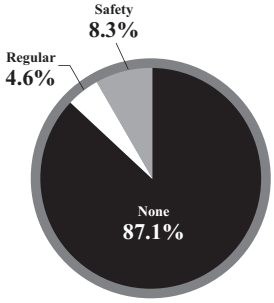
Length of Stay



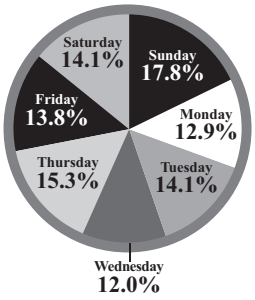
Intentionality



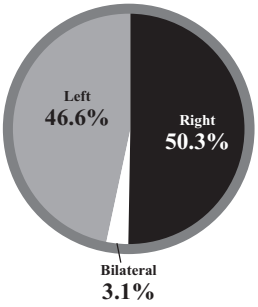
Eye Protection



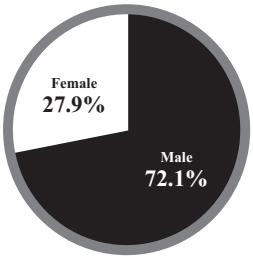
Day of Week



Eye Injured



Gender



years, patients from all across the State of Maryland and beyond (including Pennsylvania, Virginia, West Virginia, the District of Columbia, Delaware, New Jersey, New York, and North Carolina) presented to the Wilmer ETC. Baltimore City and Baltimore County together accounted for about 60% of within-Maryland origin, with Anne Arundel, Montgomery, Harford, Carroll, Frederick, Howard, Prince George's, and Washington Counties rounding out the top-10 ETC referral regions.

The Wilmer ETC's patient base remains demographically diverse and encompassing of all age groups, with higher relative burden of eye trauma observed for racial and ethnic minority groups. Male-identifying patients sustained a disproportionate share of eye injuries, nearly double that of female-identifying patients, with higher prevalence among youth and young adults. Consistent with prior years, injury intentionality was split among accidents and assaults (predominantly blunt traumas) and spanned all etiology-of-injury categories.

The Wilmer ETC sustains close partnerships with other care teams, most frequently Johns Hopkins Emergency Medicine (JHH Adult & Pediatric Emergency Departments), Anesthesiology &

Critical Care Medicine (ACCM), and Nursing. Wilmer's Patient Access Center for the Eye (PACE) clinic at JHH has continued to operate a successful same-day and same-week appointment access program dedicated to Ophthalmology patients presenting to the emergency department with non-acute eye issues, which has promoted timely and more value-based care for this emergency department-presenting population. Iterative improvements to triage and consultation protocols among Wilmer and emergency department teams has also contributed to meaningful reductions in lead time for emergency department initiation of Ophthalmology consults upon patient arrival, which in turn has had positive effects on total length of stay and patient/family experience. In addition to an in-house physician 24/7, Wilmer also has ophthalmology-trained physician assistants assisting in the care of patients. Wilmer plans to add another ophthalmology resident to its residency program to assist with a high volume of emergency department patients.

Quality Management and Improvement

Wilmer ETC core staff participated in ongoing surveillance of quality and performance metrics, escalation of and loop closure on prior trauma cases warranting special review, analysis of demographic and injury trends, assessment of operations and infrastructure needs, and generation of new ideas for trauma education, research, and outreach. In addition, they participate with and report up through the Quality Improvement Committee of the Wilmer Eye Institute, which convenes on a quarterly basis, and is directly aligned with the overall quality and safety structure and institutional initiatives at JHH. The ETC team meets quarterly with JHH emergency department leaders (quarterly, at a minimum) for detailed review of any issues related to clinical coordination and co-management of patients. The candid discussions that occur in this forum have directly contributed to improvements in handoff communication, workflows, access, quality of care, and value of care. The ETC has moved to a model of monthly data extraction and surveillance of Johns Hopkins Epic EHR-derived key performance indicators for Adult and Pediatric Emergency Department patients presenting with eye issues, including subsets of patients flagged positively for ocular trauma at the time of specialty consultation response. Wilmer staff, with oversight from the RN Program Manager, complete requisite patient data entry into the Eye Trauma Web Registry.

Injury Prevention Programs and Initiatives

The Wilmer ETC works with medical students, ophthalmology residents, public health experts, and other collaborators to analyze data and consider interventions for groups observed to have higher incidence of ocular trauma. ETC leaders continue to partner with Wilmer's Marketing and Communications team to produce social media messaging in line with American Academy of Ophthalmology eye health monthly observances, including workplace eye wellness, sports eye safety, and eye injury risks to children from toys that are frequently gifted during holiday months. Before each Fourth of July holiday, the Wilmer ETC partners with the Children's Safety Center of the Johns Hopkins Center for Injury Research and Policy to launch an article on firework safety on the Johns Hopkins website. Fasika Woreta, MD, MPH, Wilmer ETC Director, is immediate past-president of the American Society of Ocular Trauma and remains on its Board of Directors. This national consortium of program leaders organizes trauma-focused CE programs as part of broader American Academy of Ophthalmology meetings, sets and updates professional practice priorities and standards of care for eye trauma management, and participates in active, cross-institutional research and publication.

Continuing Education

Each year, the Wilmer ETC provides education on eye trauma identification and management to multidisciplinary care teams throughout the Johns Hopkins Hospital & Health System enterprise; any entities that might serve as points of entry and first response for ocular trauma patients. Nurse educators deliver eye trauma programs across JHH units to assure meeting of biannual education requirements, through learning modules that include article reviews, lectures and conferences, online continuing education, and new staff orientations. In June 2024, Wilmer held its 40th Annual Nursing and Ophthalmic Technician Conference, centered on the theme of "Managing the Psychosocial Impacts of Vision Loss". ETC Nursing also continues to co-participate in JHH and Johns Hopkins Health System-wide injury prevention education events, such as Fall Risk Awareness fairs. Wilmer ETC Director Dr. Fasika Woreta regularly lectures on eye trauma at local, regional, national, and international forums each year. A corneal suturing course around performing open globe injury repairs is held annually for our residents. Our department also sends one resident a year to the Walter Reed National Military Medical Center Ophthalmic Trauma Course.

Fellowships and Residencies

The Wilmer ETC supports a four-year ophthalmology residency program with recent integration of a medicine internship year, and currently admits five residents per program year. Wilmer residents, alongside assistant chiefs of service, faculty attendings, and staff are highly active participants in the assessment and management of ETC patients in the emergency departments, on inpatient floors, across clinics, and in the operating room. Wilmer has also launched an optometry residency program in recent years.

Rehabilitative Services

The Wilmer ETC offers its patients direct, in-house access to a full complement of clinical services and resources necessary for visual recovery or functional accommodation, in the case of irreversible injury. Wilmer's Low Vision & Vision Rehabilitation Division (led by Judy Goldstein, OD, FAAO) matches patients with assistive technologies that can enable their independence and participation in activities of daily living, and even offers some functional, in-home support services through occupational therapist experts on its staff. Wilmer's Oculoplastics Division offers functional and cosmetic surgical services to limit the after-

effects of traumatic eye injuries. ETC patients also have access to an ocularist, an expert who is highly skilled in the creation and fitting of ocular prosthetics. In June 2024, Dr. Judith Goldstein and Dr. Peter Gehlbach of the Wilmer Retina division presented to all nurses and ophthalmic technicians on best tools, techniques, and psychosocial support resources for assisting newly-blind or severely vision-limited patients and their care partners. Dr. Fatemeh Rajaii, of Wilmer's Oculoplastics division, presented on eye enucleation (surgical removal) following trauma at that same forum.

Research

The Wilmer ETC faculty is composed primarily of clinician-scientists – prolific researchers, authors, and educators in addition to expert clinicians. In FY 2024, trauma-related publications covered the full spectrum of topics (see Appendix), including research and development of innovative therapeutic protocols to improve post-trauma outcomes; enhancements in the taxonomies and meta-analysis tools for ocular trauma trending at the population level; public policy opportunities for reduction of healthcare disparities; and longitudinal clinical outcomes reviews for patients sustaining eye injuries.

Hand/Upper Extremity Trauma Center

Curtis National Hand Center, MedStar Union Memorial Hospital

201 East University Parkway, Baltimore, Maryland 21218
MIEMSS Region III

As Maryland's referral center for the specialized care of injuries to the hand, wrist, forearm, and elbow, the Curtis National Hand Center (CNHC) at MedStar Union Memorial Hospital (MUMH), located in Baltimore City, is committed to handling acute injuries and providing reconstructive surgery for Maryland's trauma victims. Its focus on complex hand, wrist, and elbow injuries has been part of the well-developed Maryland trauma care system since Dr. Raymond M. Curtis, the Center's founder, collaborated with Dr. R Adams Cowley and others during the inception of the Shock Trauma Center and the Maryland EMS system.

CNHC's emergency department cared for 2,171 patients with acute hand injuries, and 25% of the patients were transported by public safety, ambulance, or medevac helicopter. The unique nature of CNHC's services draws acutely injured patients from a broad geographic region, including Pennsylvania, Delaware, Virginia, West Virginia, and Washington, DC. Whether in Baltimore City or as far as these neighboring states, the onsite heliport facilitates reduced travel times and continues to improve the speed of intervention for the most critically injured.

CNHC's expertise in management of challenging bone and soft-tissue trauma is supplemented by advanced skills in microsurgery. CNHC's continued focus on the management of fractures, complex soft-tissue coverage problems, and amputations requiring replantation has supported CNHC's status as a regional replantation center and a member of the American Society for Surgery of the Hand/American College of Surgeons' Hand Trauma Center Network.

The acute trauma unit, staffed by specialists in orthopedic and plastic surgery with subspecialty training in hand and upper extremity surgery, is available for the care of the trauma patient 24/7/365. Calls for transfer from the field are received immediately and accepted by the emergency physicians. Transfer requests from other emergency rooms for the treatment of hand trauma patients are received via the dedicated hand transfer line. This year, this transfer center received 909 calls for transfer or consultation. Call logs of these transfer requests demonstrate an acceptance rate of greater than 94% of these patients to CNHC. The remaining cases (less than 6%) are determined to not require transfer emergently and are provided outpatient follow-up at CNHC or are referred for other specialty care due to associated injuries (e.g., burns, ophthalmologic injury, spine injury).

Professional Education

This year, CNHC expanded its academic offerings, reflecting greater collaboration with affiliated institutions and increased participation by colleagues and alumni around the region and country. The robust didactic program at CNHC includes lectures, dissections, and daily interactive conferences. Specialty labs held 15-20 times/year encompass half-day lab demonstrations and surgical simulation practice sessions. The monthly journal club symposium reviews the most up-to-date literature on a schedule of pertinent clinical topics, and includes all fellows, faculty, and other hand surgeons from around the area to ensure a robust and meaningful discussion and broader learning.

CNHC enhanced its Regional Hand Surgery Symposium, and its visiting lecture series has expanded to include impactful speakers who challenge faculty and staff with new ideas related to innovations in arthroscopy, congenital surgery, osteocartilaginous arthroplasty, microsurgery, allotransplantation, brachial plexus surgery, and forearm and elbow pathology. Speakers are invited from across the country and around the world.

Although its teaching and educational sessions have been onsite and in-person this year, CNHC has maintained the remote learning option for many events to allow broader participation and inclusion of any providers unable to attend (whether related to pandemic/quarantine or not). MedStar provides enterprise-level secure video conferencing accounts that continue to support CNHC's educational conferences and visiting speaker events.

Quality Management and Improvement

CNHC maintains a formal performance improvement process for timely problem identification, data-driven analysis, and resolution of issues within the quality framework of MedStar Union Memorial Hospital. This year, it reviewed challenging and readmitted cases for evaluation and outcomes at its monthly morbidity and mortality conference. CNHC maintains efficient electronic

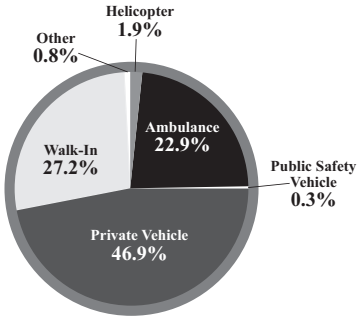
The Curtis National Hand Center at MedStar Union Memorial Hospital

(July 2023 to June 2024)

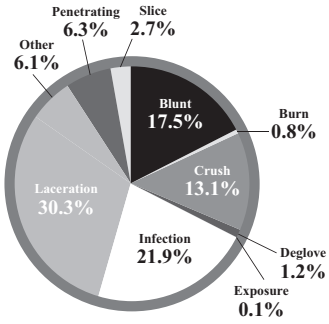
Source: The Curtis National Hand Center

n = 2,171

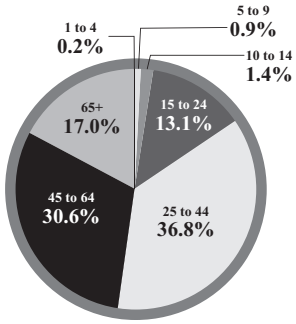
Transport Mode



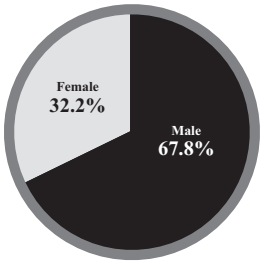
Injury Type



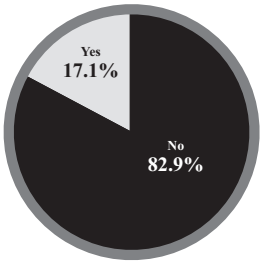
Age



Gender



Work-Related



data capture and data entry into the Maryland Trauma Registry, providing thorough, high-quality reporting. With expanded data and analytic capabilities, the Hand Center has launched quality improvement initiatives aimed at improving triage and transfer, evaluating processes of care delivery and how to optimize them across all services, and providing unique approaches to reduce patient burden after trauma.

Injury Prevention Programs and Initiatives

The Hand Center initiated community and hospital visitor outreach via social media and hospital digital wall screens that provided injury prevention and safety information about falls, bone health, lawnmowers, fireworks, and snow blowers. Each year, CNHC likewise participates in a statewide injury prevention initiative. In line with many other large upper extremity trauma centers, CNHC has initiated a focused clinic for patients that have suffered an upper extremity amputation. This clinic allows for coordination of care across hand surgery, orthotics/ prosthetics, therapy, and social work/social services during a single clinic visit, providing efficient and high-value care for amputees.

CNHC expanded its specialty offerings to include an increased focus on peripheral nerve injuries and spasticity problems in the upper extremity. With new providers that have special training and clinical focus on these areas, CNHC has expanded access to these unique services for some of our most challenging trauma and upper extremity pathology patients.

MedStar Union Memorial Hospital's (MUMH) hand surgery-led bone health program facilitated streamlined evaluation and management of patients that presented fragility fractures or bone health challenges that might affect recovery from other traumatic injuries. This partnership between hand/orthopedics, endocrinology, geriatrics, physical therapy/occupational therapy, the MedStar primary care network, and MUMH has already made a substantial impact on timeliness, capture, and management of bone health, especially in more senior trauma patients. In its second year as a full program, the bone health team treated twice as many patients (nearly 300) as in the first year.

Prehospital/EMS/Nursing Continuing Education

The MUMH Continuing Medical Education Committee oversees the continuing medical education (CME) program at the CNHC. Routine CME events are provided for the attending hand surgeons, fellows and residents, hand therapists, mid-level practitioners, nursing, and emergency department staff. Hand trauma labs are scheduled on a regular basis, giving staff the opportunity to learn, practice, and update their skills. Specialty labs for emergency department management of hand trauma are available for emergency department staff and first call providers. Advanced surgical labs are conducted for surgical staff, hand fellows, and residents. Hand surgeons provide lectures for OR staff on specialty topics as part of the OR weekly educational series, while visiting speaker events are open to all staff across the system.

Fellowships and Residencies

As one of the nation's premier training centers for hand surgery, CNHC's fellowship training program is highly sought after by the best plastic surgery and orthopedic surgery trainees in the world and prepares all graduates for management of complex upper extremity problems. CNHC offers two fellowship programs – one civilian, the other military – for advanced training in hand surgery. Additionally, CNHC provides dedicated hand surgery training rotations for residents in the Johns Hopkins Plastic Surgery, Georgetown Plastic Surgery, and MedStar Orthopedic Surgery training programs, among others.

Research

CNHC's investigative efforts have grown exponentially in the past few years. Funded by internal and external sources, research projects look at a wide range of issues, including microsurgery, peripheral nerve surgery and augmenting nerve recovery, bone and soft-tissue problems, evaluation and triage for traumatic injuries, and reconstruction after trauma. In FY 2024, CNHC continued to expand its footprint in health services research and big data analytics through an expansive data collection initiative, participating in multiple clinical trials, and coordinating numerous research efforts evaluating policy and care quality issues around hand and upper extremity trauma.

Rehabilitation

The rehabilitation team at CNHC and across the MedStar rehabilitation network works closely with CNHC hand surgeons to establish a treatment plan for each patient. CNHC's complete suite of rehabilitation services includes management of acute or chronic pain; protective splinting for immobilization and controlled motion, postoperatively or post-injury; exercise programs to restore motion, strength, and fine and gross motor coordination; home exercise programs; sensory re-education programs after nerve injury; thermal and electrical modalities to minimize pain and swelling, and more. With a wide network of subspecialized Certified Hand Therapists (CHTs) located in satellites throughout the state of Maryland, the therapy team facilitates supervised and independent therapy sessions for CNHC patients based on their specific surgical, rehabilitative, geographic, occupational, and socioeconomic requirements and restraints. In addition, CNHC offers in-person as well as teletherapy visits for its patients.

Curtis Work Rehabilitation Services

CNHC offers a rehabilitation program to assist injured workers with a safe return to their job of injury. The program helps to improve their physical functioning, endurance, and ability to perform specific duties of their job. The program consists of therapeutic exercises, conditioning activities, and job-specific work simulations. Education classes are led by the therapists and a psychologist to provide relevant information about the workers compensation process, injury adjustment, pain management, fitness and nutrition, and injury prevention.

Pain Psychology Services

Considering the impact of the opioid epidemic, especially on musculoskeletal surgery and musculoskeletal trauma, CNHC has initiated multiple programs aimed at improving pain management while reducing reliance on opioids. Part of this initiative includes working with MedStar National Rehabilitation Hospital to provide pain psychology and cognitive behavioral therapy services to many of CNHC's hand trauma patients.

Neurotrauma Center

R Adams Cowley Shock Trauma Center

22 S. Greene Street, Baltimore, Maryland
MIEMSS Region III

Located at the R Adams Cowley Shock Trauma Center (RACSTC), in the University of Maryland Medical Center, the Neurotrauma Center (NTC) provides comprehensive management for patients with injuries to the brain, spinal cord, and spinal column.

From June 1, 2023, through May 31, 2024, NTC provided care to 2,089 patients with traumatic brain injuries, 471 patients with spinal column or spinal cord injuries, and 565 patients who suffered from both traumatic brain and spinal column or spinal cord injuries, according to the Maryland State Trauma Registry. The NTC's dedicated, highly trained, and experienced multidisciplinary clinical staff includes physicians, nurses, therapy services, case management, pain management, nutritional services, integrative medicine, social work and pastoral care staff, a designated patient advocate, and a substance abuse program.

NTC patients with severe brain injury receive a multisystem assessment with intracranial pressure parameters closely monitored so factors that may cause secondary brain injury are rapidly recognized and treated, optimizing patient outcomes. Neurosurgeons are readily available to intervene, if necessary, and perform craniotomies for hematoma evacuation, gunshot wound debridement, elevation of depressed skull fractures, decompressive craniectomies, and cranioplasties. Patients with spinal cord injuries, often with cervical spine injuries, are treated

using sophisticated respiratory care protocols leading to successful weaning from mechanical ventilation for most patients.

The 12-bed Neurotrauma Critical Care Unit (NTCC) provides interdisciplinary care to critically ill patients who have sustained primarily central nervous system injury and may have other associated injuries or organ dysfunction. The NTCC operates with all required resources for critical care with the addition of specialized fiber optic, intraparenchymal and/or intraventricular intracranial pressure monitoring, cerebral oxygen monitoring and continuous electroencephalogram monitoring.

The 24-bed Neurotrauma Intermediate Care Unit (NTIMC) provides interdisciplinary care to ill patients who have sustained primarily central nervous system injury and may have other associated injuries or resolving organ dysfunction. These patients still require frequent monitoring or intensive nursing care.

The NTC's website (https://www.stcneurotrauma.org) serves as a neurotrauma resources site for all healthcare providers. The site is viewable by the general public with resources for neurotrauma patients.

Quality Improvement/Evidence-Based Practice

The NTC's quality initiatives continued to focus on reducing hospital-acquired infections, by targeting factors identified in root cause analyses done routinely on all HAIs and from feedback obtained in regular audits done by staff and Infection Prevention. An Infection Champion Nurse focused on ensuring infection prevention efforts are in use and was added to the Neurotrauma Critical Care area and staff reestablished a Catheter Associated Urinary Tract Infection (CAUTI) Crew to champion CAUTI prevention. Hospital-acquired infection prevention emphasis was on preforming appropriate daily chlorhexidine treatments, staff re-education and regular monitoring of adherence to hospital acquired infection prevention interventions, shortening the timing for bladder catheter change prior to drawing a urine culture, avoiding patient supplies near sinks and optimizing use of intermittent bladder catheterizations versus placement of indwelling catheters. The urinary catheter and central line usage standardized utilization ratio has remained consistently below 1.0 for NTCC and NTIMC was slightly above 1.0 for urinary catheter day usage in only one quarter.

Prevention of hospital-acquired pressure injuries (HAPI) remained an area of focus for the NTC's quality initiatives this year. Emphasis was on improving aspects of the novel electronic bed request portal, which allows nurses to select and order the most appropriate mattress based on patient risk factors, re-educating nurses on scoring the Braden Scale, initiating a turning strategy that decreased sacral pressure, and encouraging use of the Oceana back when patients wearing a cervical collar are in bed.

The novel guideline to manage agitation in patients with acute traumatic brain injury (TBI), developed and trialed in NTCC and NTIMC, was found to reduce agitation by 39% when compared with agitation among brain-injured patients the previous year when the guideline was not in use. This guideline utilizes non-pharmacologic interventions to prevent and treat agitation, reviews common causes of agitation to rule out and treat, addresses pharmacologic management based on patient age and Agitation Behavior Scale score, and provides tips for use of pharmacotherapy. Due to the success of the Guideline, its use has been spread to other units in the Shock Trauma Center that sometimes care for patients with traumatic brain injury and was shared at national and international conferences.

The NTC's focus on quality this year included increased use of palliative care services in the NTCC. A trigger tool was introduced for providers to use when patients had a goals of care meeting scheduled. When a trigger identified a patient with unmet palliative care needs a consult was placed to the Palliative Care service. Of eligible patients, 96% underwent a formal screening for potential unmet palliative care needs – an increase from no patients receiving formal screening prior to the tool implementation. Of the 72% (N=24) of patients identified as having positive risk of unmet palliative care needs, 54% received a palliative care consultation. This tool both increase consideration of consults to Palliative Care and an increase in actual consultations.

Injury Prevention Programs and Initiatives

The Center for Injury Prevention and Policy (CIPP) aims to reduce preventable injuries and violence, and their consequences throughout Maryland. Several injury-prevention programs operate within CIPP.

Dr. Gary Schwartzbauer, the NTC medical director, and Cara Lomangino RN, MS, CRNP, Senior Trauma Neurosurgery Nurse Practitioner, are the directors of the Maryland Shock Trauma Chapter of ThinkFirst®, a national injury prevention foundation whose mission is to prevent brain, spinal cord and other traumatic injuries through education, research and advocacy. This year, they participated in multiple ThinkFirst® community prevention programs alongside staff from the RACSTC Neurotrauma. In addition, they have presented at the ThinkFirst® Trauma Prevention Foundation National Conference, provided Brain and Behavior lectures to medical students, and testified in opposition to HB639, which proposed repealing the state law for mandatory helmet use for motorcyclists. In addition, Dr. Schwartzbauer participated in interviews for Fox 45 News and Maryland Public Television as a local expert on Traumatic Brain Injury. Over 1,500 teens were educated on head injury prevention and/or risky teen behaviors, including distracted driving. The Shock Trauma Neurosurgery team continues to be active members of Brain Injury Association of Maryland (BIAMD).

EMS and Nursing Continuing Education

This year, the NTC continued its commitment to providing education to its EMS colleagues. The RACSTC EMS Liaison team provided education to their jurisdictions covering many topics, including penetrating head injuries.

The NTC incorporates didactic education and simulations on care

of patients with traumatic brain injury and spinal cord injury as part of the Trauma Theory course. This year, four lectures and numerous articles on neurotrauma related topics were made available to all RACSTC staff, fulfilling the mandatory Neurotrauma education credits of nursing staff.

Research

The NTC's multidisciplinary team of clinical experts employs evidence-based treatment strategies designed to ensure immediate diagnostic and therapeutic access for patients with traumatic brain, spinal column, and spinal cord injuries. This year, the NTC faculty's trauma-related publications covered a variety of topics. Articles in peer-reviewed journals and neurotrauma-related grant research projects included advances in traumatic brain and spinal cord injury:

- "Overlapping Physiologic Signs of Sepsis and Paroxysmal Sympathetic Hyperactivity After Traumatic Brain injury";
- "The Neurosurgeon's Dilemma-Do Antiplatelet/ Anticoagulant Medications Increase the Risk of Catheter-Associated Hemorrhage in External Ventricular Drain Placement?";
- "Acute Development of Traumatic Intracranial Aneurysms After Civilian Gunshot Wounds to the Head";
- "Midpoint of C7 Lateral Mass Serves as an Accurate Reference Point for Placement of T1 Pedicle Screws";
- "The Role of Computed Tomography Angiography and Digital Subtraction Angiography in the Diagnosis and Management of Gunshot Wounds to the Head";
- "Feasibility of a Novel Augmented Reality Overlay for Cervical Screw Placement in Phantom Spine Models";
- "Feasibility of Augmented Reality Device-based Procedural Checklist for Bedside EVD Placement" (expanding the current and future use of augmented reality in neurosurgery);
- "Technical report: clinical feasibility of augmented reality-navigated chronic subdural hematoma evacuation"; and
- "Exploring Predictive Models for TBI Based on Big Data".

New and ongoing clinical trials include optimizing brain oxygen supply and outcomes following traumatic brain injury (TBI) using a brain oxygen monitor; determining the effect of small nucleotide polymorphisms (SNPs) on spinal cord injury outcome; delivering optimal oxygen therapy to TBI patients through hyperbaric oxygen; cooling patients with spinal cord injury to improve outcomes; using virtual reality to both assess and treat TBI in older trauma patients; and determining if maintaining spinal cord perfusion pressure (not just MAP) leads to better outcomes for spinal cord injury patients.

Rehabilitation

Part of the recovery process must start at the very instant patients arrive at the NTC, with the ultimate aim of stabilization of critical injuries followed by early rehabilitation. The NTC's emphasis on early patient mobilization as the beginning of the rehabilitative process helps to decrease morbidity associated with neurologic injury. Post-acute inpatient and outpatient services are primarily provided by the University of Maryland Rehabilitation & Orthopedic Institute.

Rehabilitation Services

Designated trauma centers within the Maryland EMS system are required to provide for the rehabilitation needs of their patients, whether provided in-house or by way of affiliation with other facilities. This service is a critical element of the continuum of care for patients who have survived traumatic injury.

Initiation of rehabilitation services begins as soon as possible following admission. Rehabilitation services are both in-patient and outpatient. Patients who experienced multiple trauma injuries resulting in temporary or long-term disability benefit from a full range of rehabilitative services dedicated to enabling them to resume active, independent lives. The most frequent injuries requiring rehabilitation are spinal cord injury, traumatic brain injury, fractures, amputations, and gunshot wounds. The goal is to enable the patient to resume their highest level of functioning by regaining strength, range of motion, and cognitive healing. Individualized rehabilitative interdisciplinary treatment plans, developed with the patient, assist in meeting their needs and goals. The initial rehabilitation team evaluates and monitors the patient, focusing on the prevention of morbidity associated with the patient's immobility, positioning, and nutrition. Rehabilitation services within the hospital setting are also useful for future rehabilitation planning, prognosis, and care. Following the acute care phase, trauma centers help the patient and/or family determine the most appropriate place to meet the patient's rehabilitation needs. Factors that affect the patient, such as functional outcomes, social needs, financial constraints, geographic location, and eligibility requirements, assist in consideration for rehabilitation placement.

There are three main types of rehabilitation: physical, occupational, and speech therapy. The purpose of each rehabilitative therapy focuses on the patient's unique circumstances in order to enable the patient to resume the greatest level of functioning.

- **Physical Therapy.** The goals of physical therapy are to relieve pain, improve movement, strength, balance, and flexibility following injury, and for teaching patients how to use devices to help the patient manage his or her mobility. A physical therapist visits the patient at the bedside or in a physical therapy setting while in the acute care hospital. Decreasing pain and limiting permanent disability ensures patients the best possible chance of returning to daily activities. Physical therapists assist patients following injuries to bones, muscles, nerves, the spinal cord, and the brain.

Top Destinations of Patients Who Went to Inpatient Rehabilitation Facilities (Aged 15 and Over) (June 2023 to May 2024)

Source: Maryland State Trauma Registry

Rehabilitation Center	Number
Adventist Health Care Rehabilitation	199
Encompass Health	258
Bay Harbor Post Acute and Healthcare Center	36
Inpatient Rehabilitation Center at MedStar Good Samaritan Hospital	17
Inpatient Rehabilitation Unit at the JHH	44
Johns Hopkins Bayview Specialty Hospital Programs	23
MedStar National Rehabilitation Hospital	70
PAM Health Rehabilitation Hospital of Georgetown	34
Sinai Rehabilitation Center	73
University of Maryland Rehabilitation & Orthopaedic Institute	316

Note: Total patients age 15 and over that went to rehabilitation centers = 1,829.

Destinations of Patients Who Went to Inpatient Rehabilitation Facilities (Aged 14 and Under) (June 2023 to May 2024)

Source: Maryland State Trauma Registry

Rehabilitation Center	Number
The HSC Pediatric Center, DC	7
Kennedy Krieger Institute	7
MedStar National Rehabilitation Hospital	3
Mount Washington Pediatric Hospital	21

Note: Total patients age 14 and under that went to rehabilitation centers = 38.

Patients may continue to see a physical therapist at home or at an outpatient center after leaving the hospital.

- **Occupational Therapy.** Occupational therapists focus on restoring a patient's ability to perform self-care, recreational activities, and everyday tasks such as getting dressed, eating, driving, and taking a shower. Occupational therapy may take place in the acute care hospital, outpatient center, and at home.
- **Speech Therapy.** The goal of speech therapy is to combine speech mechanics with the use of language for enhancing patient outcomes for communication functioning. Speech therapy can help a wide variety of issues involving language, communication, voice, swallowing, and articulation. Frequently, speech therapies are employed following a traumatic brain injury. Speech therapists help patients to swallow, eat, and better comprehend language following an injury. Speech therapy takes place in the hospital, at home, or at an outpatient center, depending on a patient's condition and needs.

The Maryland-National Capital Region Emergency Response System

Established in 2014, the Maryland-National Capital Region Emergency Response System (MDERS) serves as the single point of collaboration between fire, rescue, emergency medical services, law enforcement, emergency management, and healthcare within Montgomery and Prince George's Counties. MDERS is dedicated to supporting its stakeholders by leading the development, implementation, and sustainment of essential response capabilities that safeguard more than two million residents and visitors in the Maryland-National Capital Region. Working alongside a Steering Committee comprised of leaders from stakeholder agencies, MDERS identifies key response capabilities that need further enhancement and expansion. These priorities and their objectives are detailed in the MDERS Strategic Plan, which directs all planning, organization, equipment, training, and exercise investments for each fiscal year.

From June 1, 2023, through May 31, 2024, MDERS assisted its stakeholders in enhancing response capabilities through the provision of plan and policy development, training and exercise development and delivery, and equipment acquisition to support the missions of its partner agencies.

INVESTMENT OVERVIEW

Uniformed Services University Henry Jackson Foundation (HJF) – Incident Command Simulation

In collaboration with the MDERS, the Uniformed Services University (USU), Val G. Hemming Simulation Center, developed cutting-edge virtual reality simulation software to support MDERS partners in establishing and utilizing the Incident Command System (ICS) within a controlled training environment. This innovative proof-of-concept system enables responders to coordinate operations for all-hazards events effectively. The initial application of this reality simulation software tested participants' ability to cohesively respond to a house fire that evolved in complexity as the event unfolded. Scenarios like this can be recreated in the mobile immersive simulation environments (MISEs), set to be deployed in the Prince George's County Fire and EMS Department's Command Competency Lab. The software and hardware for this capability incorporates advanced 3D environmental modeling, comprehensive software development, dynamic training scenarios, and content creation, along with targeted training delivery and future after-action reviews to enhance PGFD's response capabilities.

Command Competency Lab Enhancements

This project facilitated the ongoing expansion and enhancement of the Command Competency Lab for the Prince George's County Fire and EMS Department. The enhancements encompassed the acquisition of advanced technology and hardware, cutting-edge software applications and licenses, and a range of essential supplies to support the development of the MISE proof-of-concept system and end-state solutions. As part of the "end-state" solution for this project, hardware was purchased including 24 pairs of 3D Glasses and two State Projectors to simulate a 180-degree 3D visual of an incident scene via a drive-up bay. The Command Competency Lab serves as a crucial training ground for both current and aspiring incident commanders within the public safety community. These state-of-the-art tools and equipment directly bolster the capability to respond to all-hazards incidents through the effective implementation of the Incident Command System (ICS).

Emerging Homeland Security Technology Pilot

MDERS supports stakeholders identifying innovative ideas and equipment to address emerging homeland security challenges. Annually, MDERS allocates 5% of its budget to this program to evaluate promising new solutions that first responders experience. MDERS procured a multitude of technology and equipment for the Montgomery County Police Department (MCPD) and Prince George's County Police Department (PGPD). To enhance operations in dark or low-light environments, MCPD received two E-COTI Thermal Monocular clip-ons and PGPD received 20 SiOnyx Aurora Pro Night Vision Monocular devices. Additionally, PGPD further enhanced its operational capabilities in austere environments by procuring 179 infrared strobe devices. These devices can be attached to officers' vests and emit a light that can help identify law enforcement personnel in limited-visibility situations. In addition, PGPD procured 25 active threat response kits for its school resource officers, consisting of a ballistic backpack that contains equipment such as pry tools, door stops, and a rigid tourniquet carrier. Leadership from both MCPD and PGPD expressed a strong interest in capturing data from training and deployments to help track the medical well-being of officers during and after an incident. Each department obtained 30 Q30 Q-Collars, while PGPD acquired blast analytic software and mitigation sensors. The Q30 Q-Collar is a device worn on the back of the neck to help minimize brain movement during impact to the head area. The blast analytic sensors can be attached to an officer's equipment and capture data, stored and analyzed on the software, which may indicate symptoms and factors related to a traumatic brain injury. Lastly, to enhance realistic training scenarios, PGPD acquired two shot boxes and an IED simulator, while MCPD obtained one shot box. These devices replicate the acoustic frequencies of gunshots and explosions, providing life-like elements for certain response operations.

Emergency Management Response and Recovery Professional Services

MDERS supported the diverse missions and functions of the Montgomery County Office of Homeland Security and Emergency Management (OEMHS) and the Prince George's County Office of Homeland Security and Emergency Management (OHS/EM) through the provision of professional services. Over the past year, the support to OEMHS has allowed it to host 80 public outreach events that resulted in engagement with 5,338 members of the community. Additionally, the allocated funds helped OEMHS to organize instructional events focused on enhancing emergency preparedness among County employees. These initiatives included conducting County facility evacuation drills, emergency operations center training, integrated emergency management training, consequence management and continuity of operations tabletop exercises, active shooter response training for civilians, a resilience hub workshop, and a school safety summit. OHS/EM has leveraged its additional professional support to review and amend Prince George's County's Emergency Operations Plan, Air Quality Procedures, Continuity of Operations Plan, and Cybersecurity policies. The support was additionally used to refine the organization's Community Lifeline mobile application, which tracks the functionality of key resources and utilities during emergencies.

Public Health Emergency Response

MDERS funded two full-time medical resource officers (MRO), one each in Montgomery and Prince George's County, to bolster public health emergency preparedness and response capabilities. These MROs led the coordination of the local Medical Reserve Corps (MRC) volunteers in both counties, including the recruitment, credentialing, planning, training, exercising, and deployment of volunteers. As part of the Montgomery County Department of Health and Human Services, the MRO and MRC achieved notable successes, including leading training initiatives related to the Public Access Trauma Care (PATC) program, naloxone administration for overdose awareness, CPR training, and support for shelter responses. Additionally, the Montgomery County MRO and MRC actively engaged with the community through participation in vaccination clinics and various regional public health events, facilitating outreach efforts. In Prince George's County, the MRO and MRC, overseen by the County's Health Department, also achieved notable accomplishments. Their contributions encompassed serving in critical roles for contact tracing efforts for COVID-19, assistance at immunization clinics, establishment of food distribution sites, and the setup of caches to facilitate point-of-distribution for emergency medicine dispersal. The training efforts led by the Prince George's County MRO and MRC focused on essential topics such as the incident command system, continuity of operations, and promoting mental health awareness within the community.

Public Access Trauma Care

MDERS continued the expansion of the Public Access Trauma Care (PATC) capability across Montgomery and Prince George's Counties. Designed to empower bystanders with the knowledge, skills, abilities, and supplies to deliver immediate medical care prior to the arrival of first responders, the PATC program deploys the equipment and training necessary to common injuries associated with life-threatening trauma. MDERS provided an additional 56 training kits to Prince George's County Public Schools (PGCPS). These kits are designed to provide the necessary equipment to supplement instruction with equipment needed for hands-on training. Furthermore, MDERS obtained foam rollers for Montgomery County Public Schools (MCPS) and PGCPS to support each jurisdiction's training for students. The foam rollers are an inexpensive option that replicates the density of a human thigh to allow students to properly practice the application of a tourniquet. It's a significant achievement and partnership that all high school seniors in both jurisdictions must complete the PATC training, along with basic first aid, to graduate.

Small Unmanned Aerial Systems (sUAS)

MDERS supported the ongoing deployment of the Small Unmanned Aerial Systems (sUAS) capability in Montgomery and Prince George's County public safety agencies through the acquisition and delivery of several sUAS flight platforms, peripheral and support accessories, and training for pilots. The culmination of this support propelled the implementation of the Drone as First Responder (DFR) program by MCPD. This initiative prepositions sUAS platforms to respond to emergency situations and provide rapid situational awareness to responding officers. Beyond this, DFR has also been able to support first responder agencies with increased aerial visibility during emergency operations. The program has been extremely successful and well-received by the County Council that MCPD is expanding the program into more areas in Montgomery County.

Soft Target Protection

MDERS partnered with MCPD to enhance the department's ability to effectively secure soft targets throughout Montgomery County. A soft target, as defined by the Department of Homeland Security, is a location that is easily accessible to a large number of people and has limited security of protective measures. To help mitigate this threat to soft targets, MCPD procured 10 camera systems that will be deployed to sensitive areas to increase situational awareness for first responder agencies. Forty deployable barriers were also procured to allow MCPD to remain adaptable and deploy these systems to secure areas that have been deemed vulnerable based on evolving threat evaluations.

Law Enforcement Tactical Equipment

MDERS remains a critical partner in supporting MCPD's and PGPD's Special Operations Division (SOD). The SOD in each department is tasked with handling complex situations that necessitate specialized equipment to meet the unique objectives they are assigned. Over the past year, MDERS helped MCPD procure advanced equipment that includes rifle rated shields, FM54 gas masks with emitters, a logistics van, and a breaching façade. Simultaneously, MDERS provided PGPD's SWAT team members with a MESH communication system, a self-contained breathing apparatus (SCBA) trailer, a response deployment vehicle, and enhancements to existing vehicles. In addition, both departments received 15 thermal augmentation devices (TAD) to assist operations in low-light environments. Through these investments, MDERS supported MCPD and PGPD's ability to expeditiously, effectively, and efficiently respond to and mitigate a variety of high-threat scenarios.

Training and Exercise Program

MDERS's Training and Exercise program offers numerous opportunities for stakeholders to develop and enhance capabilities through in-person, virtual, and hybrid curricula. Over the last year, MDERS supported the attendance of stakeholders at 34 conferences and training opportunities. Attendees were provided with the unique opportunity to learn from discipline-specific subject matter experts on a variety of topics including advanced breaching techniques, medical first receivers' operations, special operations medical care, and many more. MDERS also hosted its eighth annual symposium that was curated to educate first responders on adapting to emerging threats as part of the homeland security enterprise. Additionally, MDERS led several training initiatives for stakeholders, including an active assailant tabletop exercise at MedStar Montgomery Medical Center, an incident command tabletop series for MCPD, and a workshop and tabletop exercise for Prince George's County first responders to discuss an integrated response to an active assailant incident at schools.

MDERS Workgroups to Support Regional Activities

In FY 2024, MDERS staff supported or led workgroups and initiatives that informed the vision, deployment, expansion, and investment of critical response capabilities. Through these workgroups, MDERS identified necessary planning, organizing, equipping, training, exercising, and evaluation components necessary to enhance and sustain the Maryland-National Capital Region's public safety enterprise. These workgroups include, but are not limited to, the Structural Collapse Workgroup, sUAS Workgroup, Public Order Workgroup, Decontamination Workgroup, and the Command Competency Workgroup.

Representation in Regional Activities

MDERS represented its stakeholders by holding positions on regional committees hosted through the Metropolitan Washington Council of Governments (COG). As a conduit between the local jurisdictions and the larger National Capital Region (NCR), MDERS minimized the burden on stakeholder agencies while ensuring their interests are represented and supported through regional funding. MDERS staff members participated in meetings and activities, including involvement in Regional Emergency Support Function (RESF) Committees; Regional Programmatic Working Groups; Regional Planning Guidance Working Group; the NCR Emergency Response System; and the NCR Homeland Security Executive Committee (HSEC), Policy Group, and Advisory Council.

Emergency and Disaster Health Systems Department, University of Maryland Baltimore County (UMBC)

The Department of Emergency and Disaster Health Systems (formerly the Department of Emergency Health Services), or EDHS, is a center of excellence for EMS and emergency public health education and research at the University of Maryland Baltimore County (UMBC). EDHS educates practitioners, clinicians, scholars, and leaders in community and emergency health and disaster management. EDHS works to improve the well-being of individuals and communities and increase health equity by leading innovative research, education, policy development, practice, and service in community and emergency health and disaster management.

Since its formation in the 1980s as MIEMSS' research and education arm, EDHS has graduated an impressive number of students, many of whom have become federal, state, and local EMS leaders, physicians, medical directors, researchers, and administrators. EDHS provides undergraduate, master's, and doctoral-level education to future and existing prehospital and emergency public health clinicians, emergency management, and disaster health leaders. Undergraduate programs include a Paramedic concentration and Emergency and Disaster Management tracks. These undergraduate programs deliver instruction in evidence-based EMS practices and skill-based learning, while providing opportunities for students to gain experience in their communities and understand the EMS role in the healthcare continuum.

The EDHS Graduate Program includes a track in EHS Administration, Planning, and Policy, emphasizing high-performance EMS and expanding student capacity to develop, support, and evaluate facilities and EMS transport systems in order to optimize prehospital healthcare delivery. The track in Epidemiology and Preventive Medicine focuses on the integration of public health, emergency management, and emergency preparedness. In addition, EDHS offers two graduate-level certificates: 1) a disaster-focused Certificate in Emergency Management and 2) a new Healthcare Emergency Management Certificate.

EDHS is affiliated with the UMBC School of Public Policy Doctoral Program, where students can pursue a doctorate in Public Policy with a specialization in Emergency Health or Emergency Management, strengthening the EHS workforce in the policy and administrative arena.

The Department's Professional and Continuing Education (PACE) operation provides professional education opportunities to local, regional, and national EMS responders. PACE's signature program, Critical Care Emergency Medical Transport Program (CCEMTP), continues to grow, having reached 19,000 students through 967 courses offered at 56 university/community college and educational sites nationwide.

The Paramedic refresher and CCEMTP programs collaborate with the University of Maryland Medical System EMS Residents and Fellows. As of June 30, 2024, the Pediatric and Neonatal Critical Care Transport Program (PNCCT) – the pediatric equivalent of CCEMTP – has reached 1,400 students through 107 courses and 12 sites. PACE continues its relationship with ICISF to support the CISM certification exam and CISM course offerings. In addition, PACE maintains the AHA Training Center, offering ACLS, PALS, and CPR, and serves as the State of Maryland ITLS Chapter for all ITLS courses across the state.

Learn more at https://edhs.umbc.edu.

Maryland Poison Center, University of Maryland School of Pharmacy

The Maryland Poison Center (MPC) works to decrease the cost and complexity of poisoning and overdose care while maintaining and/or improving patient outcomes. A division of the University of Maryland School of Pharmacy, MPC is designated by MIEMSS as a specialty referral center and by the Maryland Department of Health (MDH) as a regional poison center for Maryland. MPC provides 24/7 emergency poison information to the public and health professionals across the state. MPC is accessed by calling the nationwide poison help telephone number, 1-800-222-1222, or via the Emergency Medical Resource Center (EMRC).

MPC is certified by the American Association of Poison Control Centers (AAPCC) as a regional poison center. It has provided poisoning treatment advice, education, and prevention services to

Marylanders since 1972. MPC's poison specialists are pharmacists and nurses who are certified as specialists in poison information (CSPI) by AAPCC. MPC's 15 specialists have over 175 years of combined poison center experience, ensuring that callers have access to experienced, qualified, and well-trained staff.

In CY 2023, MPC managed more than 37,000 cases. While 30,000 of these cases involved human exposure, the remaining 7,000 were requests for information or involved animal exposures. Children under the age of 6 accounted for 38.1% of poison exposures. The top five causes of poisoning were analgesics, household cleaners, antidepressants, cardiovascular drugs, and cosmetics and personal care products. More than 65% of the cases reported to MPC were managed at a site not providing health care, such as the home, school, or workplace. Maryland EMS clinicians consulted with MPC on 1,499 cases in CY 2023. In 15% of those cases, transportation by EMS to a healthcare facility was deemed unnecessary and avoided based on MPC advice. Safely managing patients at the site of the exposure avoids unnecessary healthcare costs and allows more efficient and effective use of limited healthcare resources.

MPC works closely with the National Capital Poison Center and other state and national agencies to monitor for possible chemical and biological weapons exposures and public health events throughout Maryland and the Washington, DC, region. MPC's data-collection system allows data to be submitted in real time to a nationwide poison center surveillance system. In addition to the astute clinicians covering the service 24 hours a day, automated symptom and substance outlier detection strategies are used to help identify evolving patterns or emerging clusters of exposures.

MPC partners with MDH's Behavioral Health Administration and the Maryland Office of the Chief Medical Examiner to address the rise in opioid overdoses and deaths. MPC provides a vital service to the state's Overdose Response Program by directly managing overdose cases as well as helping the state document naloxone administration by the lay public and law enforcement officers. In CY 2023, MPC was involved in over 200 reports of bystander naloxone administration. MPC shares its data with state and local health departments on a weekly basis to help them respond to the opioid epidemic.

MPC staff conduct research to advance the prevention, diagnosis, and treatment of poisonings. A complete list of MPC research efforts can be found in the forthcoming Maryland Poison Center 2023 Annual Report.

MPC's public education efforts are intended to help prevent poisonings from occurring and to increase awareness of the Center's services. In CY 2023, MPC attended 30 programs throughout Maryland, reaching approximately 2,700 people. Organizations that partnered with MPC to provide education included fire and police departments, hospitals, health departments, pharmacies, hospital perinatal education programs, Head Start, Healthy Start, and local health improvement coalitions. Seventeen county school systems and daycare centers used educational materials from MPC in their classrooms. MPC distributed more than 171,000 pieces of educational materials (brochures, magnets, telephone stickers, Mr. Yuk stickers, teachers' kits, and more) at programs, schools, health fairs, and by direct mailings.

National Poison Prevention Week (March 17-23, 2023) activities included mailings to emergency departments and elementary schools throughout the state. To provide Poison Prevention Week toolkits to elementary schools, MPC partnered with elementary school nurses in eight counties to offer Poison Prevention Week materials. Schools could choose from a list of materials and activities to increase awareness of poison safety to the students and their families. In all, 52 schools participated, reaching over 24,000 students and their families.

MPC publishes Poison Prevention Press, a bimonthly e-newsletter for the public that highlights poison safety topics, and shares content on topics related to poison prevention and safety with the public via its Facebook, Instagram, and X channels, as well as its blog, e-Antidote. Additionally, MPC shares important clinical and medical toxicology information, updates, and news with health professionals via its monthly e-newsletter, ToxTidbits, and

Reason for Poisoning (CY 2023)

Circumstance	*Number of Patients*	*Percentage*
Unintentional	22,736	76.0
Intentional	5,699	19.1
Adverse Reaction	942	3.1
Other and Unknown	533	1.8
TOTAL	**29,910**	**100.0**

Medical Outcome of Poisoning (CY 2023)

Medical Outcome	*Number of Patients*	*Percentage*
No Effect/Minor Effect	25,261	84.5
Moderate Effect	2,247	7.5
Major Effect	633	2.1
Death	34	0.1
Other and Unknown	1,735	5.8
TOTAL	**29,910**	**100.0**

Location of Poisoning Exposure by MIEMSS Region (CY 2023)

Region	*Number of Exposures*	*Percentage*
Region I	744	2.5
Region II	2,194	7.3
Region III	18,185	60.8
Region IV	2,933	9.8
Region V*	3,200	10.7
Unknown County/ Other state	2,654	8.9
TOTAL	**29,910**	**100.0**

**Routing for the nationwide telephone number automatically connects most callers from Montgomery and Prince George's Counties to the National Capital Poison Center in Washington, D.C. This report reflects calls to the Maryland Poison Center only. Additional human exposures in Maryland may have been reported to the National Capital Poison Center.*

its dedicated accompanying X channel.

MPC's educational programming and materials are designed to help health professionals better assess and manage poisoning and overdose cases. In CY 2023, MPC presented 16 programs at hospitals, EMS/fire departments, colleges, professional conferences (state, regional, and national), and through online webinars. More than 4,600 physicians, nurses, EMS clinicians, pharmacists, physician assistants, and other health professionals attended these programs and webinars. MPC likewise provides onsite training for physicians, pharmacists, and EMS clinicians.

National Study Center for Trauma and EMS

The Charles "McC." Mathias, Jr., National Study Center for Trauma and EMS (NSC) was established at the University of Maryland by the US Congress in 1986. In 2009, the University of Maryland School of Medicine (UMSOM) designated NSC as part of the Shock, Trauma and Anesthesiology Research Organized Research Center (STAR-ORC) to further basic, translational, and clinical studies in injury research.

Research Activities

NSC, in conjunction with the R Adams Cowley Shock Trauma Center (RACSTC), is a leading participant in the Crash Injury Research and Engineering Network (CIREN), funded by the National Highway Traffic Safety Administration (NHTSA). During the 2023 to 2024 contract year, 111 motor vehicle crash occupants and nine (9) pedestrians have been enrolled. Of these, 28 have been enrolled and undergone a comprehensive investigation and review. NSC virtually hosted NHTSA representatives, members of the Maryland Highway Safety Office (MHSO), and other CIREN partners during the associated monthly case reviews. In February 2024, NSC hosted NHTSA Deputy Administrator Sophie Shulman and Region 3 Administrator Stephanie Hancock. During their visit, the NHTSA leadership engaged with NSC staff to discuss ongoing traffic safety research, including projects under the Crash Injury Research and Engineering Network (CIREN) and the Maryland Highway Safety Office. The visit also featured a tour of the R Adams Cowley Shock Trauma Center, highlighting the collaboration between research and clinical practice. The use of CIREN cases in biomechanics presentations at the RACSTC is integral, providing valuable insights into crash injury mechanisms and informing improvements in vehicle safety and trauma care.

NSC received a grant from NHTSA CIREN Research for a project titled "Transportation Data Linkage and Cost of Injury Analysis". This project involved matching and deterministic linkage of the nationally representative Crash Investigation Sampling System (CISS) data, HSCRC (inpatient and outpatient), CIREN data, and Shock Trauma Registry data. The analysis of cost included machine learning techniques and matching procedures. The models indicated body regions that, if injured, contribute significantly to the cost of treating the injuries, broken out by hospital and provider charges. The body regions most implicated were the abdomen and lower extremities.

In FY 2024, NSC continued adding updated data sets to the Injury Outcomes Data Evaluation System (IODES), with the goal of producing a census of injury data in the state, including causes of injuries, treatments, and long-term consequences. The NSC also worked to update and upkeep the citations and adjudications data. The NSC executed an updated Data Use Agreement (DUA) with the Health Services Cost Review Commission (HSCRC) that covers data access until 2026 under IODES. Further, the NSC executed a DUA with the Maryland Motor Vehicle Administration for access to their datasets under IODES. The NSC is also in advanced discussions with the Maryland Judiciary and the Maryland Office of the Coroner and Medical Examiner to establish DUAs. Similarly, existing DUAs with MIEMSS and the Maryland State Police are due for renewal, with discussions progressing. These agreements help cement IODES as the premier injury data warehouse for the State of Maryland. IODES is intended to produce a census and yield a complete picture of all injuries, including penetrating trauma such as gunshots and stabbings, and blunt trauma such as falls and other injury-producing incidents in the state of Maryland.

As part of IODES, the NSC continued supporting the development of the Center for Innovation in Clinical and Translational Shock and Injury Research (CISIR), a platform through which the data under IODES will be made available to researchers with the appropriate approvals for their study from an Institutional Review Board and partner data sharing agencies. Currently, CISIR has built a repository of data from the University of Maryland Medical System (UMMS) Electronic Health Records (EHR) that includes detailed data on patient admissions to the UMMS systems for trauma and injuries.

The data under IODES are a valuable resource for the State in furthering efforts to reduce statewide trauma and injury burdens through all mechanisms, including motor vehicle crashes, falls, assaults, firearm violence, and others. The NSC actively develops data-driven insights into the circumstances, background, and behaviors causing and furthering these issues. For example, under a grant from the Maryland Motor Vehicle Administration's Highway Safety Office (MHSO), NSC serves as a key data analysis resource and partner for MHSO, MVA, and other state and local traffic safety partners.

Data provided through IODES are used for portions of the Maryland Strategic Highway Safety Plan (SHSP), Federal Highway Safety Plan, MHSO Annual Report, and to support several problem identification and program evaluation activities across the state. Each year, NSC produces Problem Identification Reports and Program Area Briefs for local jurisdictions to aid in the development of Local Strategic Highway Safety Plans.

This year, NSC staff conducted analyses and provided reports, diagrams, graphs, or slides on occupant protection, pedestrian and bicyclist fatalities and serious injuries, impaired driving by young-

er drivers, child pedestrian fatalities, race/ethnicity variables in crash data, child passenger safety, young drivers with young passengers involved in crashes, multiple DUI arrests and subsequent adjudication, multiple PBJs for DUI within 10 years, school bus stop arm cameras, motorcycle helmet law talking points for legislative session, cell phone citations (single/multiple offenses), and behaviors that lead to crash involvement. Some of these products are available at https://zerodeathsmd.gov/resources/crashdata/.
In spring 2024, NSC was awarded a grant from the MHSO to review the current processes for collecting data related to aggressive driving in Maryland. The project involved investigation into state police records, county and municipality police departments, traffic fatalities, civil and criminal citations data, automatic traffic control data, and State Highway Administration data. NSC also met with several states' highway safety offices, including Virginia, Delaware, North Carolina, Pennsylvania, and the District of Columbia, to discuss aggressive driving data for Maryland drivers in these states.

NSC facilitates the Traffic Records Coordinating Committee and provides data expertise on SHSP Implementation and Emphasis Area Teams. NSC researchers continued to provide key analyses that help with more accurately determining arrests and correct licensing numbers of reoffending drivers with impairment in FY 2024.

Findings from the 2023 Maryland Front Seat Belt Use Project conducted by the NSC were presented virtually at the Spring 2023 Occupant Protection and Distracted Driving Emphasis Area Team Meeting of the MHSO. The usage rate on all roadways for both passenger cars/SUVs and pick-up trucks was 92.1% in 2023. Analysis has commenced on the 2024 statewide restraint usage study, conducted in June 2024.

In 2020, NSC completed a comprehensive report on drug-use pattern analysis, funded by the Maryland Highway Safety Office. The study aimed to merge Drug Recognition Expert (DRE) data with the Maryland

Citation database using drivers' full names. This linkage enabled an in-depth analysis of citation data in relation to positive drug screen results, including the identification of repeat offenders. Additionally, GIS maps were created to pinpoint the locations of DRE cases and crashes, highlighting relevant driver characteristics. This approach helped identify areas for targeted DRE outreach to prevent situations where DRE officers were needed but unavailable.

Later, the results and findings were presented at the ATSIP conference in 2021. Initially, NSC only used data from 2017 to March 2020. Subsequently, NSC extended the study to include five years of data and published a paper titled "An Analysis of Drug Recognition Expert Evaluations and Comparisons with Police Issued Citations in Maryland, 2017-2021." This study examined the evaluation data collected by Maryland DRE from 2017 to 2021 and assessed the DRE opinion of drug categories with blood tests conducted during DRE evaluations. The paper was well-received and accepted at the TRB conference, where NSC gave a lecture presentation in January 2024. Currently, NSC is working on updating the paper for submission to Traffic Injury Prevention for publication.

NSC worked on integrating admission and treatment records of patients presenting to the R Adams Cowley Shock Trauma Center status post-motor vehicle crash from 2016 through to 2021 with police reported crash data and Functional Roadway Classification (FRC) data from MDOT. The resulting dataset contained detailed patient toxicology data, police crash data, and the class of the roadway on which the crash occurred, in addition to basic patient demographics. The NSC researchers then modeled the data using Ordinal Logistic Regression to regress injury severity as a function of basic patient demographics, FRC, crash report attributes, and toxicology results. The findings indicate that crashes from lower speed local roadways produce more severe injuries at a high level of statistical significance. The findings have also shown that alcohol impairment at any level is conducive to increased likelihood of more severe outcomes. These findings were presented at the Transportation Research Board Annual Meeting, held in January 2024 in Washington, DC. The paper is being finalized for submission to Analytic Methods in Accident Research.

The NSC developed an experimental equity indicator for socioeconomic and traffic safety disadvantage for the State of Maryland. The results were presented at the 2024 Maryland Highway Safety Summit that included a live dashboard with maps on a zip code-level with the equity indicator.

NSC staff attended the Maryland Drug Impaired Driving Toxicology Meeting on April 25 2024. The event provided a valuable platform for discussing the state of drug-impaired driving toxicology in Maryland, with presentations from key figures such as Maryland State Police Chief Toxicologist Dr. Haley Mulder and Christine Nizer, Administrator of the Maryland Department of Transportation Motor Vehicle Administration. Topics covered included the strengths and challenges of Maryland's toxicology program, opportunities for improvement, and policy implications. Small group discussions allowed for in-depth exploration of specific issues like toxicology testing, the impact of decriminalized cannabis, data integration, and tools for law enforcement and prosecutors. These discussions promoted collaboration and knowledge sharing among attendees, leading to actionable insights and strategies to enhance the effectiveness and efficiency of drug-impaired driving interventions. The conference was instrumental in identifying high-priority items and immediate actions to improve community safety and support ongoing efforts to reduce impaired driving incidents in Maryland. Additionally, this conference further opened communication and provided a platform to collaborate and partner with the Office of the Chief Medical Examiner (OCME) for future research opportunities.

The NSC is responsible for the extraction of data from the R Adams Cowley Shock Trauma Registry (STCTR) for research protocols with appropriate permissions. Over the past year, NSC has

written over 30 SQL-based queries to the STCTR. Study topic areas have been diverse, as demonstrated by the following limited list: dysautonomia in TBI; nutrition outcomes in older adults with TBI; damage control laparotomy and infectious complications; re-evaluation of the incidence of coagulopathy; identifying markers of youth gun violence; the long-term implications of cerebral venous sinus thrombosis; CSF immune response after TBI; aging effects on cerebral blood flow in concussion; and machine learning model of ultra massive blood transfusion. The STCTR is often utilized to generate patient population estimates for research study proposals to ensure a sufficient number of patients meeting study inclusion and exclusion criteria will be admitted.

The NSC launched several self-funded projects looking into a diverse array of cutting-edge traffic safety research areas. These areas focus on new modes, driver education, and infrastructure. The projects align with the Safe System Approach (SSA) adopted by the Federal Highway Administration (FHWA) and US Department of Transportation (USDOT) and related agencies including NHTSA. The findings from the studies were presented at multiple conferences, including ATSIP (Association of Transportation Safety Information Professionals) Traffic Records Forum in Nashville (July 9–12, 2023) and the Transportation Research Board Annual Meeting in Washington DC (January 7–11, 2023). The findings indicate that a majority of e-scooter riders in Baltimore are intoxicated; high-risk driving behaviors exhibited by teenagers are seldom rectified by adulthood; and crashes on local streets and arterials over the past six years produce graver injuries than high-speed, high-flow facilities like the Interstates. NSC completed the initial analysis of traffic stops and race in Maryland. The analysis was based on seven years of data from the online dashboard on race-based traffic stop data from the Governor's Office of Crime Prevention, Youth, and Victim Services. In the analysis, NSC compared the percentage of Black drivers involved in traffic stops and the percentage of Black drivers' licenses overall as well as by county. Additionally, the analysis compared officers' perceptions of race and the self-reported race determination by the driver. A series of statistical tests was performed related to the "veil of darkness" hypothesis, traffic stop disposition, and vehicular searches.

Analytical Support

In addition to in-house preparation of peer-reviewed research papers, NSC staff offer grant proposal, abstract, and manuscript preparation support, including technical writing, research design, and data analysis for university, hospital, and trauma center researchers. Partner agencies and the public can submit a specific data request to NSC epidemiologists and data analysts using the data request form on NSC's website (https://issomweb02.som.umaryland.edu/NSCTrauma/NSCData.aspx). NSC staff members were instrumental in the publication of manuscripts on various trauma and injury-related topics, such as acute pancreatitis, influence of lower extremity fracture fixation on neurologic outcomes, and anticoagulation in emergency general surgery.

NSC offers comprehensive statistical support to various research groups at UMB, ranging from Acute Care Surgery to Orthopaedics to Lung Transplantation Survival Research. Findings from these groups were published in the American Surgeon, the Journal of Trauma and Acute Care Surgery, and the Journal of Orthopaedic Trauma, and co-authored by NSC researchers. Additionally, NSC extends its expertise to research projects funded by esteemed organizations like the National Institutes of Health (NIH), US Department of Defense, and US Army Medical Research, ensuring a robust and data-driven approach to cutting-edge research.

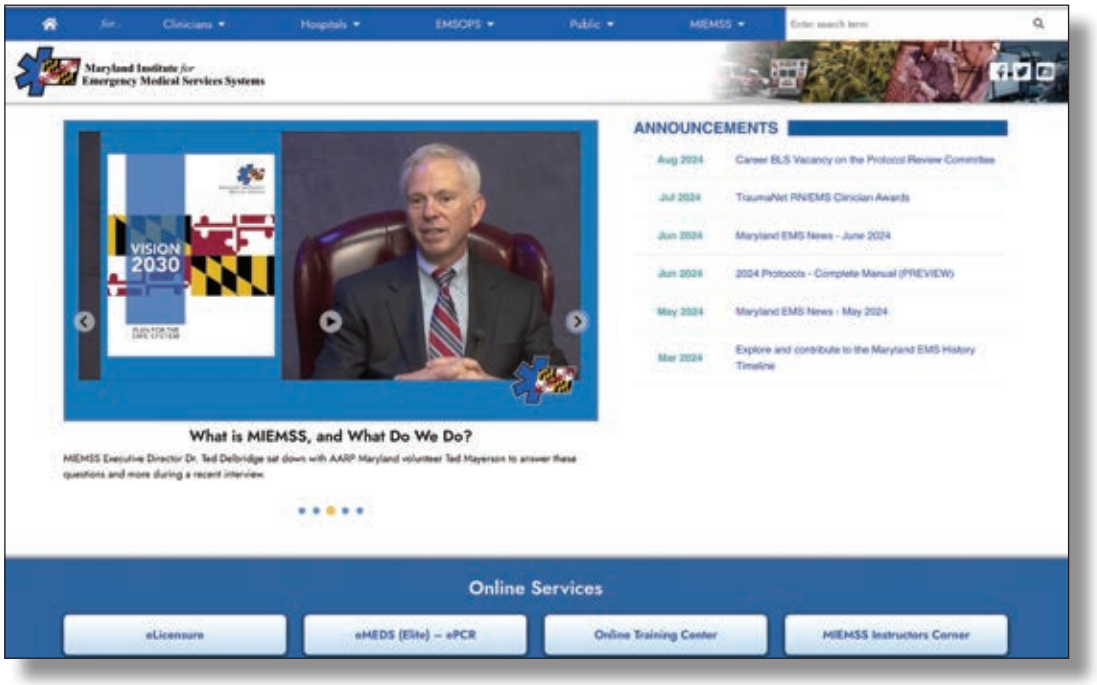
MIEMSSS-Research Interest Group (RIG)

Research Interest Group (RIG) is composed of members from MIEMSS, the National Study Center (NSC), and other partners including, but not limited to, higher education institutions (including JHU), EMS Operational Programs, and regional partners from Washington, DC, and Northern Virginia. NSC is organizing and leading the monthly meetings of RIG.

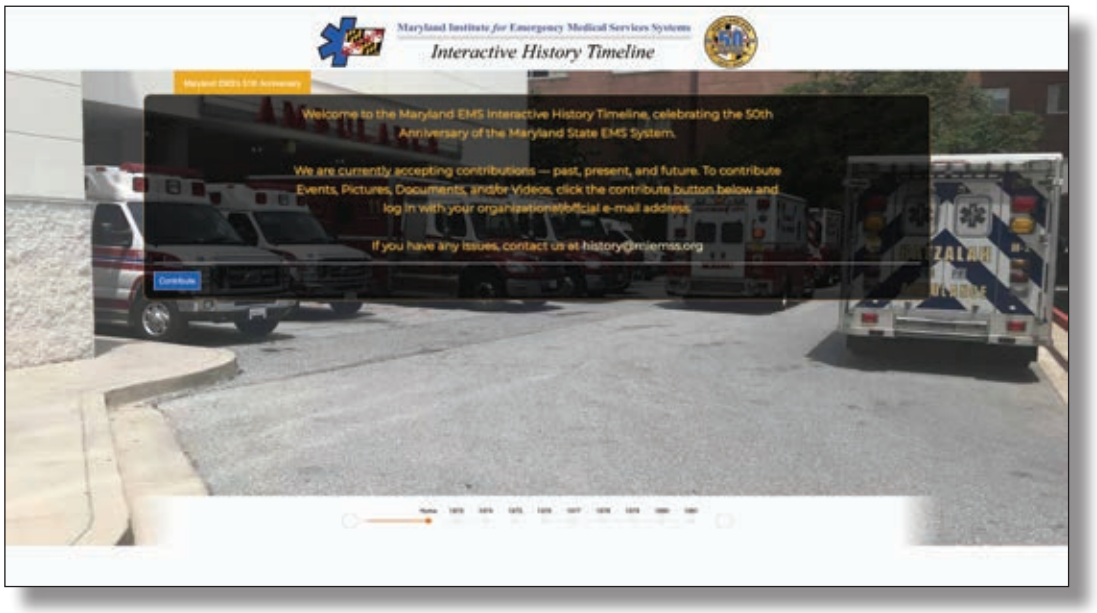
Over the last year, MIEMSS-RIG members have submitted one paper, related to cardiac arrest and epinephrine use in Maryland, for publication. A second paper analysis, concerning transfer of care times, is ongoing. In addition, members serve on MIEMSS committees in support of the agency's mission. NSC members continue to serve on several MIEMSS committees and help advance the agency's mission.

MIEMSS ONLINE

Please visit us online to learn more about MIEMSS and the Maryland EMS System.



MIEMSS Website (miemss.org)



Maryland EMS History Timeline (history.miemss.org)

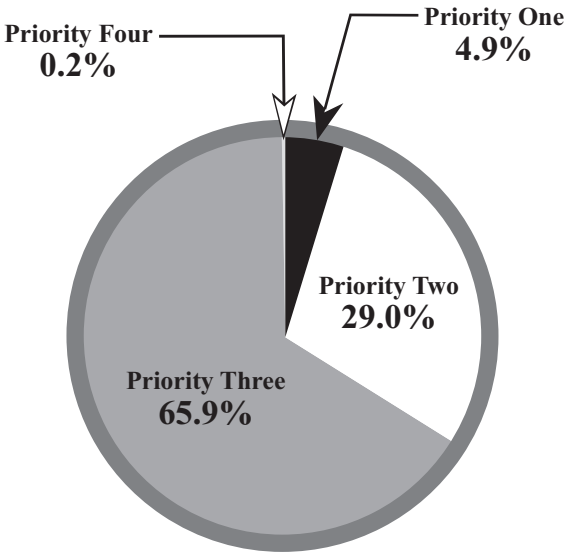
@MarylandEMS **@MarylandEMS** **@maryland_ems**

MARYLAND EMS STATISTICS

Types of EMS Calls

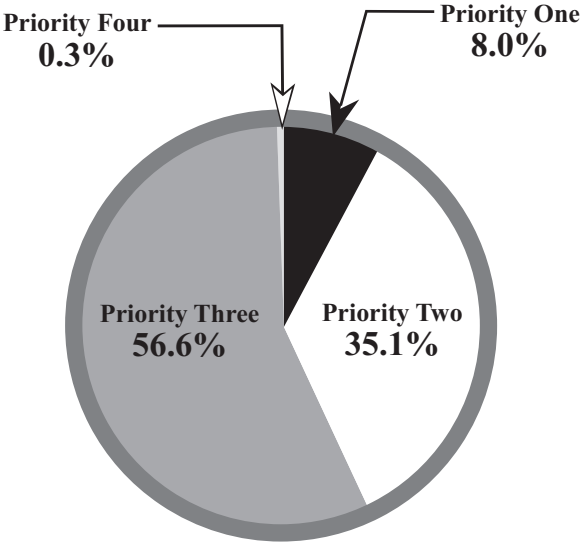
Patient Priority For Injury-Related Transports

Fiscal Year 2024



Patient Priority For Medical-Related Transports

Fiscal Year 2024



Source: electronic Maryland EMS Data System (eMEDS®)

Priority 1 *- Patient critically ill or injured (immediate / unstable)*
Priority 2 *- Patient less serious (urgent / potentially life-threatening)*
Priority 3 *- Patient non-urgent*
Priority 4 *- Patient does not require medical attention*

Cardiac Arrest Registry to Enhance Survival (CARES)
CY 2023 Registry Data

Demographic Information	Maryland	National
Mean Age (years)	63.2	62.1
% Males	60.3%	63.0%
% Females	39.7%	37.0%

Arrest Witnessed?	Maryland	National
Witnessed by Bystander	32.7%	36.7%
Witnessed by First Responder/EMS	12.1%	11.8%
Unwitnessed	55.2%	51.5%

Who Initiated CPR?	Maryland	National
Bystander	40.9%	41.5%
First Responder	28.3%	31.2%
Emergency Medical Services (EMS)	30.8%	27.3%

Who First Defibrillated the Patient?	Maryland	National
Not Applicable	73.0%	70.1%
Bystander	1.8%	1.6%
First Responder	3.9%	6.1%
Emergency Medical Services (EMS)	21.3%	22.2%

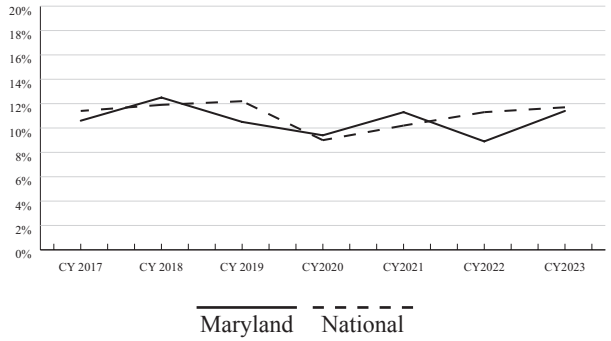
***Bystander Intervention Rates are calculated as follows:**

Bystander CPR: Arrests that occurred before the arrival of First Responders/EMS and that did not occur in a nursing home, health care facility, physician's office or clinic, in which CPR was initiated by lay persons, out of all arrests that occurred before the arrival of First Responders/EMS and that did not occur in a home/residence, nursing home, health care facility, physician's office, or clinic.

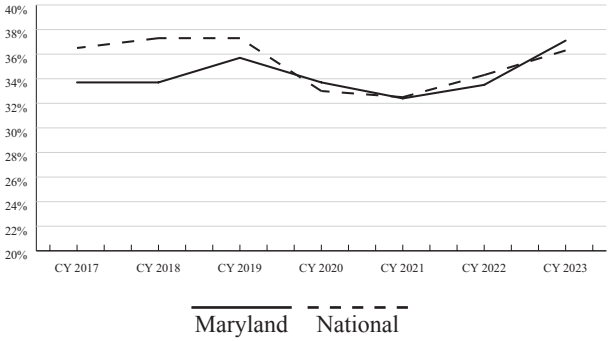
Public AED Use: Arrests that occurred before the arrival of First Responders/EMS and that did not occur in a home/residence, nursing home, health care facility, physician's office or clinic, in which AEDs were initially applied by lay persons out of all arrests that occurred before the arrival of First Responders/EMS and that did not occur in a home/residence, nursing home, health care facility, physician's office, or clinic.

Cardiac Arrest Registry to Enhance Survival (CARES)
CY 2017 through CY 2023 (Source: CARES Registry)

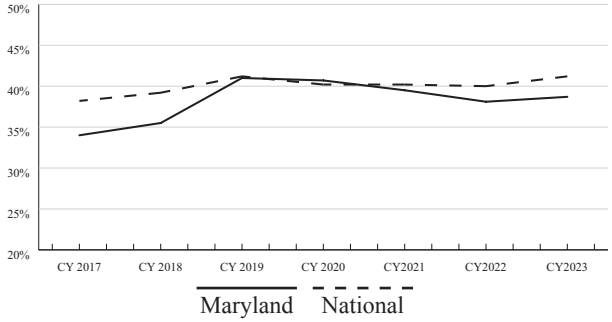
Maryland and National Public AED Use Rates



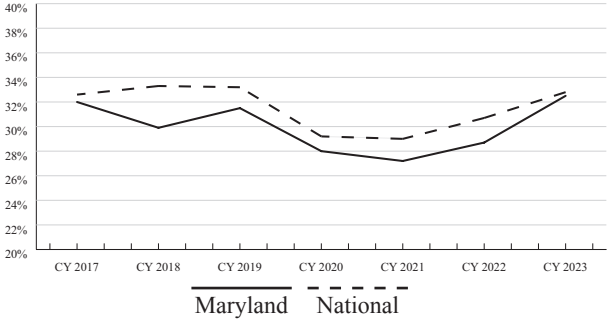
Survival Rates for Patients with Out of Hospital Cardiac Arrests With First Arrest Rhythms That Were Shockable and Witnessed by Bystanders and Bystanders Either Performed CPR and/or Applied AEDs



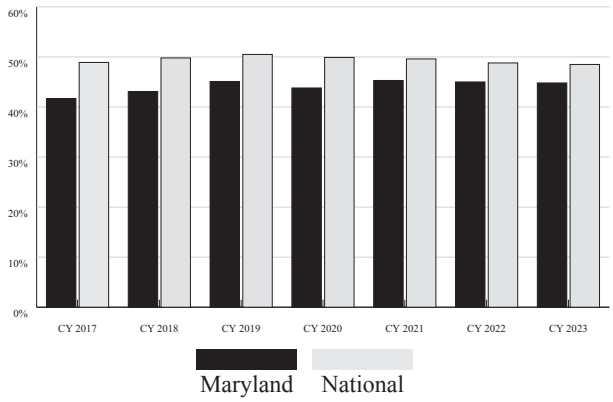
Maryland and National Bystander CPR Rates



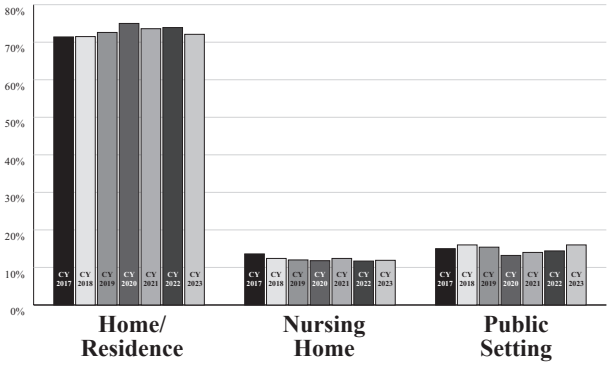
Survival Rates for Patients with Out of Hospital Cardiac Arrests That Were Witnessed by Bystanders and Had First Arrest Rhythms That Were Shockable



Percentage of Cardiac Arrests That Were Witnessed by Bystanders and/or First Responder/EMS by Calendar Year



Location of Cardiac Arrest



*See page 70 for intervention rate formulas.

Public Safety EMS Units

Patient Transportation Vehicles

Region	Ambulances								Ambulance Buses	
	BLS				ALS				Type I	Type II
	In-Service	Peak Hours	Ready Reserve	Unstocked, Unequipped Reserve	In-Service	Peak Hours	Ready Reserve	Unstocked, Unequipped Reserve	20 + Patients	10 - 19 Patients
Region I	2	0	0	0	18	3	12	0	0	0
Region II	39	0	5	8	11	2	0	0	0	1
Region III	17	3	19	16	123	15	23	48	0	2
Region IV	9	4	20	2	61	26	70	9	0	1
Region V	118	17	47	22	51	11	29	1	1	2
STATEWIDE TOTAL	**185**	**24**	**91**	**48**	**264**	**57**	**140**	**58**	**1**	**6**

NOTE: Excludes federal EMS Operational Programs.
Source: Vehicle data reported by the EMS Operational Programs

Patient Transportation Vehicle Definitions:

Basic Life Support (BLS) Transport Vehicle: A vehicle equipped to carry and treat a patient per EMT Protocols
Advanced Life Support (ALS) Transport Vehicle: A vehicle equipped to carry and treat a patient per Cardiac Rescue Technician (CRT, CRT99) or Paramedic protocols
Total Equipped: Includes units that are equipped as either BLS or ALS and that are available for staffing in the event of system surge
Staffed 24/7: EMS clinicians assigned and ready to respond to a 9-1-1 call
Ambulance Bus: A passenger bus configured or modified to transport as many as 20 patients on stretchers

Public Safety/Non-Transportation Vehicles

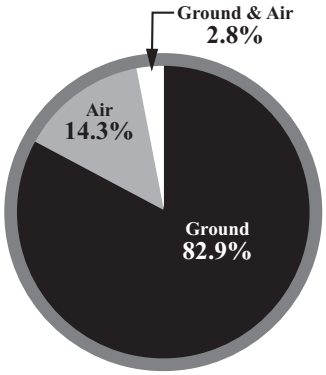
Region	Non-Transport Support				Disaster Supplies		
	BLS Capable First Responder		ALS Capable First Responder		MCSU Type I	MCSU Type II	MCSU Type III
	Non-Suppression	Suppression	Non-Suppression	Suppression	100+ Patients	50 Patients	25 Patients
Region I	8	13	6	1	0	2	1
Region II	17	36	6	13	0	2	3
Region III	26	238	24	28	5	5	0
Region IV	65	104	34	2	0	2	3
Region V	39	114	32	46	0	8	1
STATEWIDE TOTAL	**155**	**505**	**102**	**90**	**5**	**19**	**8**

NOTE: Excludes federal EMS Operational Programs.
Source: Vehicle data reported by the EMS Operational Programs
***MCSU = Mass Casualty Support Unit*

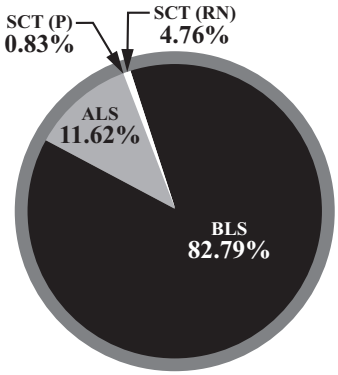
Maryland-Licensed Commercial Ambulance FY 2024 Statistics

Source: MIEMSS Commercial Ambulance Licensing System

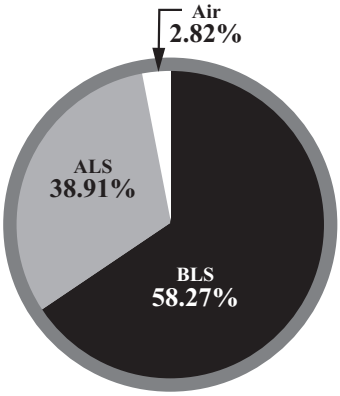
SOCALR-Licensed Services
n = 35



SOCALR Total Calls
n = 239,115



SOCALR-Licensed Vehicles
n = 496



Patient Care Reporting Records Submitted to MIEMSS by Maryland Jurisdictions

The electronic Maryland EMS Data System (eMEDS®) enables Maryland's EMS clinicians to document and produce an electronic patient care record (ePCR). Additionally, it serves as a primary resource to query data about EMS demand, response, and outcome. All jurisdictional EMSOPs in Maryland use eMEDS® to document their call information. The EMSOPs can enter data either via a local device with internet connectivity or via a dedicated website. The table below displays the quarterly record volume for FY 2024.

eMEDS® Records Submitted to MIEMSS per Fiscal Year 2024 Quarter[1]

Reporting Between: 7/1/2023 - 06/30/2024

EMSOP	1st Qtr. FY 2024	2nd Qtr. FY 2024	3rd Qtr. FY 2024	4th Qtr. FY 2024	Total
Airports: BWI & Martins	1,186	1,263	1,357	1,704	**5,510**
Allegany County	4,554	4,612	4,212	4,114	**17,492**
Annapolis City	2,829	2,739	2,453	2,662	**10,683**
Anne Arundel County	19,254	19,212	18,010	18,821	**75,297**
Baltimore City	55,860	51,136	49,906	55,917	**212,819**
Baltimore County	34,949	36,137	34,978	35,411	**141,475**
Calvert County	4,253	4,343	4,256	4,411	**17,263**
Caroline County	1,737	1,868	1,740	1,757	**7,102**
Carroll County	6,545	7,046	6,407	6,637	**26,635**
Cecil County	4,156	3,931	3,823	4,026	**15,936**
Charles County	7,941	7,655	7,700	8,076	**31,372**
Dorchester County	2,224	2,071	2,067	2,055	**8,417**
Frederick County	13,474	14,316	13,982	14,298	**56,070**
Garrett County	1,400	1,387	1,340	1,232	**5,359**
Harford County	9,224	9,990	8,837	9,185	**37,236**
Howard County	8,958	9,024	8,609	8,989	**35,580**
Kent County	1,241	1,270	1,233	1,442	**5,186**
Montgomery County	24,717	25,582	25,382	24,902	**100,583**
MSP Aviation Command	586	472	376	565	**1,999**
Ocean City, Town of	3,327	1,284	1,071	1,995	**7,677**
Prince George's County	48,494	50,262	47,824	48,694	**195,274**
Queen Anne's County	2,269	2,267	2,230	2,263	**9,029**
Salisbury, City of	3,195	3,181	3,164	2,915	**12,455**
Somerset County	999	1,031	926	1,080	**4,036**
St. Mary's County	6,196	6,559	6,015	6,194	**24,964**
Talbot County	1,938	2,017	1,744	1,844	**7,543**
Washington County	9,365	9,238	8,979	9,378	**36,960**
Wicomico County	2,159	2,100	1,977	1,923	**8,159**
Worcester County	2,097	2,116	1,979	2,055	**8,247**
Other EMSOPs	1,411	1,374	1,205	1,361	**5,351**
Grand Total	286,538	285,483	273,782	285,906	**1,131,709**

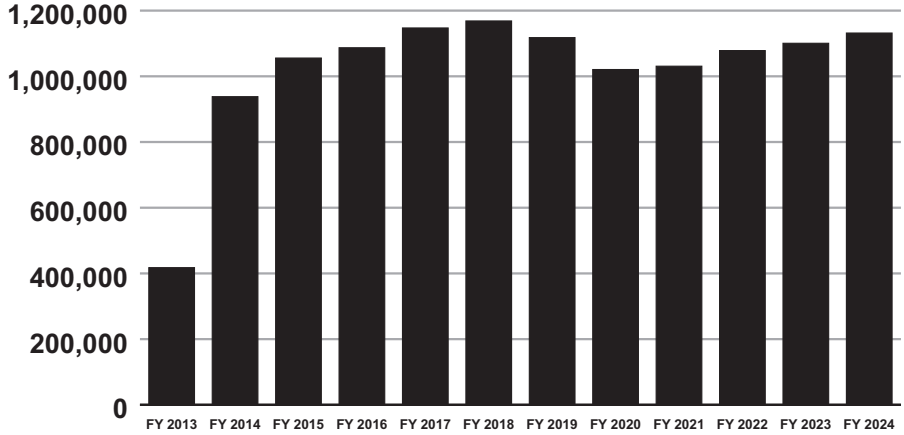
[1]The number of records submitted to MIEMSS does not necessarily represent the number of individual patients treated. Duplicate records can be submitted for the same patient if more than one EMS company responds to treat that patient. Number of records also include both EMS reports and Mobile Integrated Health (MIH) reports.

eMEDS® Records Submitted to MIEMSS per Quarter

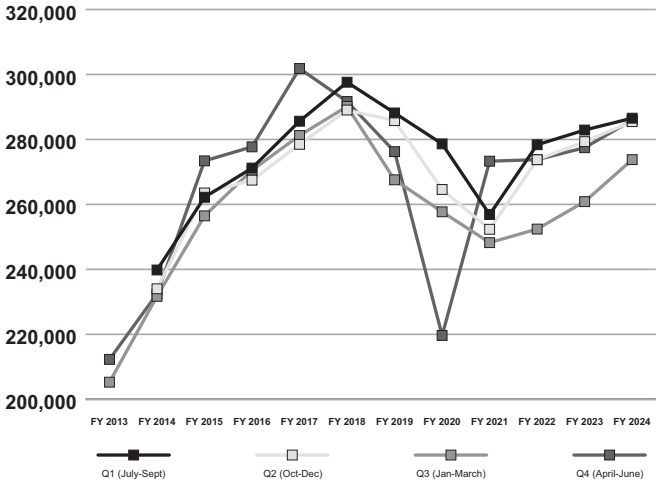
Reporting Between: FY 2013 - FY 2023

EMSOP	1st Qtr. (July-Sept)	2nd Qtr. (Oct-Dec)	3rd Qtr. (Jan-March)	4th Qtr. (April-June)	Total
FY 2013			205,278	212,297	**417,575**
FY 2014	239,810	234,029	231,699	232,470	**938,008**
FY 2015	262,197	263,515	256,475	273,403	**1,055,590**
FY 2016	271,193	267,467	270,538	277,714	**1,086,912**
FY 2017	285,611	278,493	281,211	301,832	**1,147,147**
FY 2018	297,614	289,044	290,157	291,666	**1,168,481**
FY 2019	288,151	285,788	267,566	276,245	**1,117,750**
FY 2020	278,630	264,598	257,723	219,655	**1,020,606**
FY 2021	256,887	252,341	248,229	273,306	**1,030,763**
FY 2022	278,362	273,760	252,406	273,778	**1,078,306**
FY 2023	282,893	279,324	260,853	277,455	**1,100,525**
FY 2024	286,538	285,483	273,782	285,906	**1,131,709**

eMEDS® Records Submitted to MIEMSS per Fiscal Year 2013-2024



eMEDS® Records Submitted to MIEMSS per Fiscal Year by Quarter 2013-2024



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MARYLAND TRAUMA AND BURN STATISTICS

Age Distribution of Patients Treated at Pediatric or Adult Trauma Centers

(3-Year Comparison)
Source: Maryland State Trauma Registry

Age Range	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Under 1 year	249	231	280
1 to 4 years	478	515	591
5 to 9 years	605	626	672
10 to 14 years	754	751	867
15 to 24 years	3,296	3,477	3,644
25 to 44 years	6,616	6,662	6,883
45 to 64 years	4,917	5,052	5,581
65+ years	7,609	8,845	11,056
Unknown	6	5	6
TOTAL	24,530	26,164	29,580

For children who were burn patients at Children's National Hospital or Johns Hopkins Pediatric Trauma Center, see Maryland Pediatric Burn Statistics.

MARYLAND ADULT TRAUMA STATISTICS

Total Cases Reported by Trauma Centers

(3-Year Comparison)
Source: Maryland State Trauma Registry

Trauma Center	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
The Johns Hopkins Bayview Medical Center	2,663	2,419	2,796
The Johns Hopkins Medical System	2,206	2,620	2,835
Meritus Medical Center	2,763	2,986	3,838
R Adams Cowley Shock Trauma Center	5,159	5,687	5,922
Sinai Hospital of Baltimore	2,565	2,375	2,653
Suburban Hospital – Johns Hopkins Medicine	2,029	2,316	2,502
TidalHealth Peninsula Regional	1,821	2,190	2,667
University of Maryland Capital Region Medical Center	2,880	2,941	3,217
UPMC Western Maryland	639	755	989
TOTAL	22,725	24,289	27,419

Occurrence of Injury by County: Scene Origin Cases Only

(June 2023 to May 2024)
Source: Maryland State Trauma Registry

County of Injury	Number
Allegany County	702
Anne Arundel County	1,032
Baltimore County	3,457
Calvert County	144
Caroline County	49
Carroll County	310
Cecil County	38
Charles County	235
Dorchester County	186
Frederick County	505
Garrett County	45
Harford County	551
Howard County	425
Kent County	31
Montgomery County	2,036
Prince George's County	2,138
Queen Anne's County	75
St. Mary's County	228
Somerset County	226
Talbot County	70
Washington County	2,610
Wicomico County	936
Worcester County	574
Baltimore City	4,407
Virginia	99
West Virginia	177
Pennsylvania	387
Washington, DC	33
Delaware	145
Other	13
Not Indicated	1,240
TOTAL	23,104

Note: Scene origin cases represent 84.3% of the total trauma cases treated statewide.

Residence of Patients by County: Scene Origin Cases Only

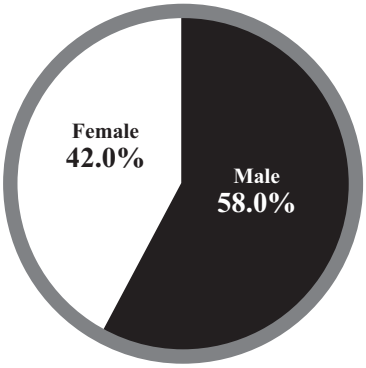
(June 2023 to May 2024)
Source: Maryland State Trauma Registry

County of Residence	Number
Allegany County	643
Anne Arundel County	1,115
Baltimore County	3,681
Calvert County	171
Caroline County	70
Carroll County	325
Cecil County	55
Charles County	270
Dorchester County	159
Frederick County	455
Garrett County	40
Harford County	581
Howard County	392
Kent County	30
Montgomery County	2,072
Prince George's County	1,913
Queen Anne's County	81
St. Mary's County	222
Somerset County	218
Talbot County	64
Washington County	2,679
Wicomico County	849
Worcester County	384
Baltimore City	3,930
Virginia	393
West Virginia	319
Pennsylvania	686
Washington, DC	373
Delaware	253
Other	448
Not Indicated	233
TOTAL	23,104

Note: Scene origin cases represent 84.3% of the total trauma cases treated statewide.

Gender Profile: Primary Admissions Only

(June 2023 to May 2024)
Source: Maryland State Trauma Registry



Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.

Patients with Protective Devices at Time of Trauma Incident: Primary Admissions Only

(3-Year Comparison)
Source: Maryland State Trauma Registry

Protective Device	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
None	22.6%	23.8%	22.4%
Seatbelt	10.1%	11.8%	8.7%
Airbag and Seatbelt	39.0%	37.3%	38.0%
Airbag Only	12.7%	12.0%	15.6%
Infant/Child Seat	0.1%	0.0%	0.1%
Protective Helmet	15.3%	14.9%	14.7%
Padding/Protective Clothing	0.1%	0.1%	0.2%
Other Protective Device	0.1%	0.0%	0.1%
Unknown	0.0%	0.1%	0.2%
TOTAL	100.0%	100.0%	100.0%

Note: Patients were involved in motor vehicle, motorcycle, bicycle, and sports-related incidents only. "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.

Legend Code

Johns Hopkins Bayview Medical Center	BVMC	Suburban Hospital – Johns Hopkins Medicine	SUB
The Johns Hopkins Hospital	JHH	TidalHealth Peninsula Regional	THPR
Meritus Medical Center	MMC	University of Maryland	
R Adams Cowley Shock Trauma Center	STC	Capital Region Health	UMCRH
Sinai Hospital	SH	UPMC Western Maryland	UPMCWM

Mode of Patient Transport to Trauma Centers: Scene Origin Cases Only

(June 2023 to May 2024)
Source: Maryland State Trauma Registry

Modality Type	BVMC	JHH	MMC	THPR	CRMC	SH	STC	SUB	WM	TOTAL
Ground Ambulance	94.0%	72.8%	79.5%	95.2%	88.7%	96.1%	77.8%	89.9%	70.3%	85.0%
Helicopter	0.2%	1.3%	0.3%	1.3%	7.8%	0.3%	20.6%	0.1%	0.4%	4.9%
Other	5.8%	25.9%	20.2%	3.5%	3.5%	3.6%	1.6%	10.0%	29.3%	10.1%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note: Only patients brought directly from the scene to a trauma center are included in this table.

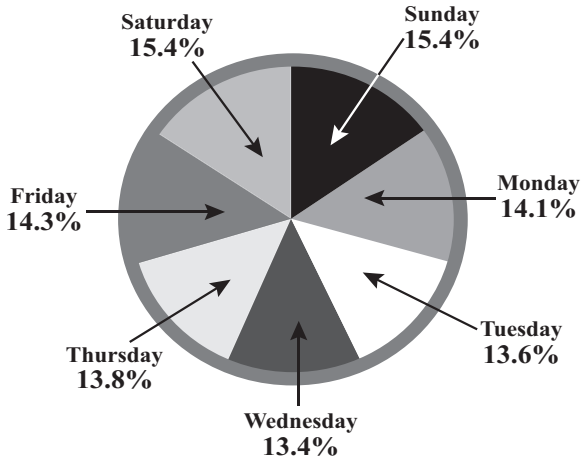
Origin of Patient Transport to Trauma Centers

(June 2023 to May 2024)
Source: Maryland State Trauma Registry

Origin Type	BVMC	JHH	MMC	THPR	CRMC	SH	STC	SUB	WM	TOTAL
Scene of Injury	96.3%	80.6%	97.3%	78.1%	88.3%	85.8%	66.7%	93.7%	96.6%	84.5%
Hospital Transfer	0.4%	6.7%	0.1%	1.4%	3.5%	8.4%	32.8%	4.2%	0.7%	9.6%
Other	3.3%	12.7%	2.6%	20.5%	8.2%	5.8%	0.5%	2.1%	2.7%	5.9%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

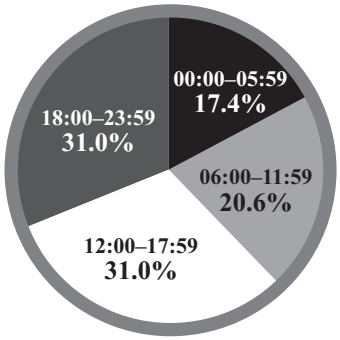
Emergency Department Arrivals by Day of Week: Primary Admissions Only

(June 2023 to May 2024)
Source: Maryland State Trauma Registry



Emergency Department Arrivals by Time of Day: Primary Admissions Only

(June 2023 to May 2024)
Source: Maryland State Trauma Registry



Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.

Number of Deaths by Age
(3-Year Comparison)
Source: Maryland State Trauma Registry

Age	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Under 1 year	1	0	0
1 to 4 years	0	0	2
5 to 14 years	5	3	4
15 to 24 years	122	104	101
25 to 44 years	257	210	196
45 to 64 years	161	173	153
65+ years	315	303	354
Unknown	2	1	2
TOTAL	863	794	812
Deaths Overall as a Percentage of the Total Injuries Treated	3.8%	3.3%	3.0%

Note: Only pediatric patients who were treated at Adult Trauma Centers are included in this table. For patients treated at Pediatric Trauma Centers, see Maryland Pediatric Trauma Statistics.

Number of Injuries by Age
(3-Year Comparison)
Source: Maryland State Trauma Registry

Age	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2023
Under 1 year	64	65	76
1 to 4 years	113	120	145
5 to 14 years	273	270	298
15 to 24 years	3,130	3,272	3,376
25 to 44 years	6,615	6,661	6,881
45 to 64 years	4,915	5,051	5,581
65+ years	7,609	8,845	11,056
Unknown	6	5	6
TOTAL	22,725	24,289	27,419

Note: Only pediatric patients who were treated at Adult Trauma Centers are included in this table. For patients treated at Pediatric Trauma Centers, see Maryland Pediatric Trauma Statistics.

Number of Injuries and Deaths by Age
(June 2023 to May 2024)
Source: Maryland State Trauma Registry

	Number of Injured Patients		Number of Deaths	
Age	Total	Maryland Residents	Total	Maryland Residents
Under 1 year	76	66	0	0
1 to 4 years	145	120	2	2
5 to 14 years	298	235	4	3
15 to 24 years	3,376	2,965	101	89
25 to 44 years	6,881	5,947	196	167
45 to 64 years	5,581	4,930	153	138
65+ years	11,056	10,112	354	328
Unknown	6	2	2	0
TOTAL	27,419	24,377	812	727

Note: Only pediatric patients who were treated at Adult Trauma Centers are included in this table. For patients treated at Pediatric Trauma Centers, see Maryland Pediatric Trauma Statistics.

Etiology of Injuries to Patients Primary Admissions Only
(3-Year Comparison)
Source: Maryland State Trauma Registry

Etiology	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Cut/Stab	4.7%	4.4%	4.2%
Drowning/Submersion	0.1%	0.0%	0.1%
Fall	46.2%	48.0%	51.8%
Fire or Flame	0.3%	0.2%	0.3%
Hot Object or Substance	0.1%	0.2%	0.3%
Gun Shot Wound	7.7%	6.9%	5.1%
Machinery/Mechanical	0.7%	0.6%	0.6%
Motor Vehicle Crash	23.4%	22.3%	20.9%
Motorcycle Crash	3.6%	3.3%	3.3%
Bicycle Crash	1.7%	1.6%	1.4%
Pedestrian Incident	4.6%	4.8%	4.2%
Other Transport*	0.1%	0.1%	0.1%
Natural or Environmental	0.5%	0.6%	0.8%
Poisoning	0.2%	0.3%	0.3%
Struck by Object	4.5%	5.1%	5.1%
Other	1.6%	1.6%	1.5%
TOTAL	100.0%	100.0%	100.0%

*Note: *Injuries sustained in "Other Transport" include injuries while boating, using personal water craft, in airplanes, etc. "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.*

Blood Alcohol Content of Patients* Primary Admissions Only
(3-Year Comparison)
Source: Maryland State Trauma Registry

Blood Alcohol Content	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Negative	44.8%	44.4%	41.5%
Positive	16.6%	16.1%	14.2%
Undetermined	38.6%	39.5%	44.3%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.

**Due to changes in the software and how the data was reported, the percentages have changed from what was reported in previous years.*

Etiology of Injuries by Age: Primary Admissions Only

(June 2023 to May 2024)
Source: Maryland State Trauma Registry

Age	Motor Vehicle Crash	Motorcycle	Pedestrian	Fall	Gunshot Wound	Stab Wound	Struck by Object	Bicyclist	Other	Total
Under 1 year	0.1%	0.0%	0.1%	0.2%	0.1%	0.1%	0.0%	0.0%	1.3%	0.2%
1 to 4 years	0.2%	0.0%	0.4%	0.2%	0.1%	0.1%	0.3%	0.0%	2.1%	0.2%
5 to 14 years	0.7%	0.2%	0.6%	0.6%	0.4%	0.6%	0.9%	4.3%	2.0%	0.8%
15 to 24 years	19.2%	17.7%	16.5%	2.0%	39.7%	19.0%	14.8%	10.6%	10.5%	10.5%
25 to 44 years	36.9%	43.4%	37.2%	8.0%	44.3%	53.9%	46.7%	25.0%	36.7%	23.6%
45 to 64 years	23.9%	30.5%	30.0%	17.1%	13.0%	21.0%	25.0%	39.0%	28.0%	20.6%
65+ years	19.0%	8.2%	15.2%	71.9%	2.4%	5.3%	12.3%	21.1%	19.4%	44.1%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival. Only pediatric patients who were treated at Adult Trauma Centers are included in this table. For patients treated at Pediatric Trauma Centers, see Pediatric Trauma Center tables and graphs.

Etiology Distribution for Patients with Blunt Injuries: Primary Admissions Only

(June 2023 to May 2024)
Source: Maryland State Trauma Registry

Etiology	Percentage
Cut/Stab	0.2%
Fall	57.8%
Machinery/Mechanical	0.6%
Motor Vehicle Crash	23.4%
Motorcycle Crash	3.7%
Bicyclist Crash	1.6%
Pedestrian Incident	4.7%
Other Transport*	0.1%
Natural or Environmental	0.3%
Struck by Object	5.5%
Other	1.2%
Not Valued	2.6%
TOTAL	100.0%

*Note: *Injuries sustained in "Other Transport" include injuries while boating, using personal water craft, in airplanes, etc. Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.*

Etiology Distribution for Patients with Penetrating Injuries: Primary Admissions Only

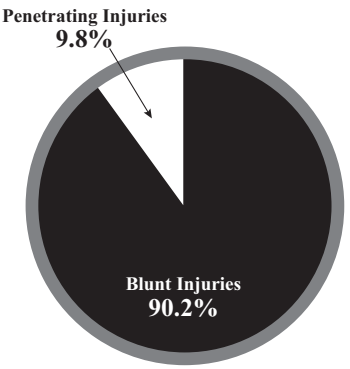
(June 2023 to May 2024)
Source: Maryland State Trauma Registry

Etiology	Percentage
Cut/Stab	40.9%
Fall	1.2%
Gunshot Wound	53.2%
Machinery/Mechanical	0.6%
Motor Vehicle Crash	0.1%
Pedestrian Incident	0.1%
Other Transport*	0.1%
Natural or Environmental	1.2%
Struck by Object	0.7%
Other	0.5%
Not Valued	1.4%
TOTAL	100.0%

*Note: *Injuries sustained in "Other Transport" include injuries while boating, using personal water craft, in airplanes, etc. "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.*

Injury Type Distribution of Patients: Primary Admissions Only

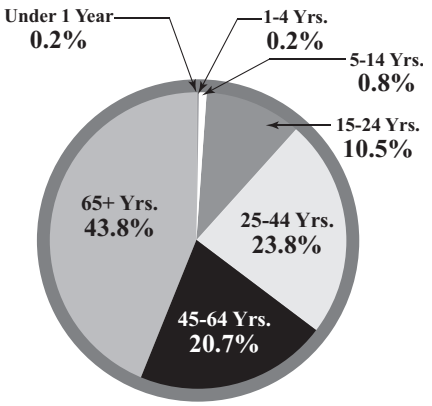
(June 2023 to May 2024)
Source: Maryland State Trauma Registry



Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.

Age Distribution of Patients: Primary Admissions Only

(June 2023 to May 2024)
Source: Maryland State Trauma Registry



Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival. Only pediatric patients who were treated at Adult Trauma Centers are included in this table. For patients treated at Pediatric Trauma Centers, see Pediatric Trauma Center tables and graphs.

Final Disposition of Patients: Primary Admissions Only

(3-Year Comparison)

Source: Maryland State Trauma Registry

Final Disposition	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Inpatient Rehab Facility	8.4%	8.4%	9.1%
Skilled Nursing Facility	13.4%	13.4%	13.4%
Residential Facility	1.2%	1.0%	1.0%
Specialty Referral Center	4.3%	4.2%	4.2%
Home with Services	8.3%	8.7%	9.5%
Home	50.8%	52.3%	50.8%
Acute Care Hospital	2.3%	2.1%	2.0%
Left Against Medical Advice	2.6%	2.1%	2.2%
Morgue/Died	5.0%	4.3%	4.0%
Left without Treatment	0.1%	0.1%	0.1%
Intermediate Care Facility	0.0%	0.1%	0.0%
Hospice Care	0.9%	1.0%	1.1%
Jail	0.9%	0.8%	0.9%
Psychiatric Hospital	1.3%	1.0%	1.1%
Elopement	0.3%	0.3%	0.5%
Other	0.2%	0.2%	0.1%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.

Injury Severity Scores of Patients with Penetrating Injuries: Primary Admissions Only

(3-Year Comparison)

Source: Maryland State Trauma Registry

ISS	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
1 to 8	46.1%	48.6%	52.8%
9 to 14	26.4%	26.9%	27.9%
16 to 24	10.6%	11.1%	7.9%
25 to 75	16.9%	13.4%	11.4%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.

Injury Severity Scores (ISS) by Injury Type: Primary Admissions Only

(June 2023 to May 2024)

Source: Maryland State Trauma Registry

ISS	Blunt	Penetrating	Total
1 to 8	51.9%	52.8%	52.0%
9 to 14	34.1%	27.9%	33.4%
16 to 24	8.2%	7.9%	8.2%
25 to 75	5.8%	11.4%	6.4%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.

Injury Severity Scores of Patients with Blunt Injuries: Primary Admissions Only

(3-Year Comparison)

Source: Maryland State Trauma Registry

ISS	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
1 to 8	49.8%	50.2%	51.9%
9 to 14	34.0%	34.7%	34.1%
16 to 24	9.6%	9.0%	8.2%
25 to 75	6.6%	6.1%	5.8%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.

Injury Severity Scores of Patients with Either Blunt or Penetrating Injuries: Primary Admissions Only

(3-Year Comparison)

Source: Maryland State Trauma Registry

ISS	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
1 to 8	49.3%	50.0%	52.0%
9 to 14	33.0%	33.8%	33.4%
16 to 24	9.7%	9.2%	8.2%
25 to 75	8.0%	7.0%	6.4%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within six hours of emergency department arrival.

MARYLAND ADULT BURN STATISTICS

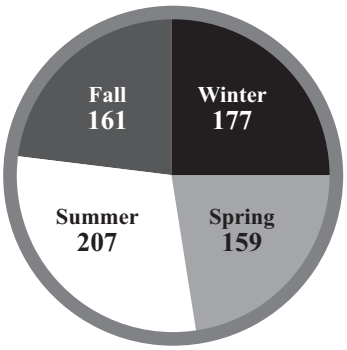
Total Number of Adult Burn Cases

Patients Aged 15 and Older Treated at Johns Hopkins Burn Center at Bayview (3-Year Comparison)
Source: Maryland State Trauma Registry

Institution	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Johns Hopkins Burn Center at Bayview	715	661	704

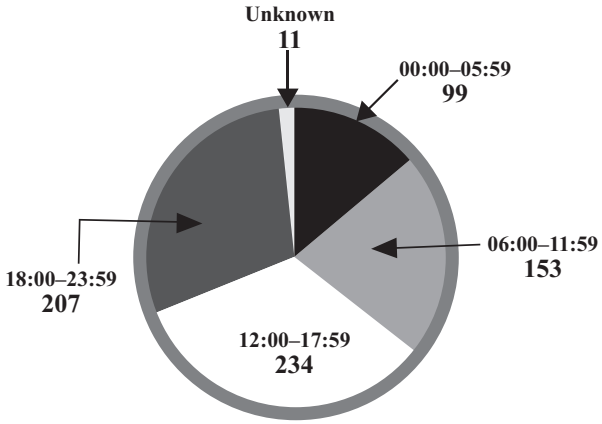
Season of Year Distribution

Patients Aged 15 and Older Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry



Time of Arrival Distribution

Patients Aged 15 and Older Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry



Place of Injury

Patients Aged 15 and Older Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

Place of Injury	Number
Non-Institutional Private Residence	405
Institutional Private Residence	19
School, Other Institution and Public Administrative Area	11
Sports and Athletic Area	1
Street/Highway	30
Trade and Service Area	46
Industrial and Construction Area	17
Other Places	23
Unspecified Places	152
TOTAL	704

Occurrence of Injury by County

Patients Aged Fifteen and Older Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

County of Injury	Number
Allegany County	2
Anne Arundel County	58
Baltimore County	150
Calvert County	1
Carroll County	9
Cecil County	12
Charles County	1
Dorchester County	6
Frederick County	12
Harford County	24
Howard County	21
Kent County	3
Montgomery County	6
Prince George's County	6
Somerset County	3
Talbot County	4
Washington County	15
Wicomico County	7
Worcester County	4
Baltimore City	209
Virginia	7
West Virginia	8
Pennsylvania	16
Delaware	1
Other	3
Not Valued	116
TOTAL	704

Residence of Patients by County

Patients Aged 15 and Older Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

County of Residence	Number
Allegany County	3
Anne Arundel County	63
Baltimore County	183
Calvert County	2
Caroline County	2
Carroll County	13
Cecil County	14
Charles County	1
Dorchester County	4
Frederick County	12
Harford County	31
Howard County	28
Kent County	3
Montgomery County	10
Prince George's County	14
Queen Anne's County	1
Somerset County	2
Talbot County	3
Washington County	16
Wicomico County	8
Worcester County	3
Baltimore City	222
Virginia	5
West Virginia	12
District of Columbia	2
Pennsylvania	25
Delaware	3
Other	8
Not Valued	11
TOTAL	704

Mode of Patient Transport

Patients Aged 15 and Older Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

Modality Type	Number
Ground Ambulance	355
Helicopter	27
Other*	304
Not Valued	18
TOTAL	704

**Note: The category "Other" includes patients who were brought in by fixed wing ambulance, private or public vehicles, or were walk-ins.*

Etiology of Injuries by Age

Patients Aged 15 and Older Treated at Johns Hopkins Burn Center at Bayview
(June 2023 to May 2024)
Source: Maryland State Trauma Registry

Age Range	Electrical	Chemical	Thermal			Inhalation	Other Burn	Other Non-Burn	Not Valued	Total
			Flame	Contact	Scald					
15 to 24 years	0	2	25	21	44	2	1	0	10	105
25 to 44 years	6	5	73	40	99	3	4	1	35	266
45 to 64 years	3	6	77	30	55	4	2	3	34	214
65 years and over	0	2	46	13	34	7	0	0	8	110
Not Valued	0	0	0	0	0	0	0	0	9	9
Total	9	15	221	104	232	16	7	4	96	704

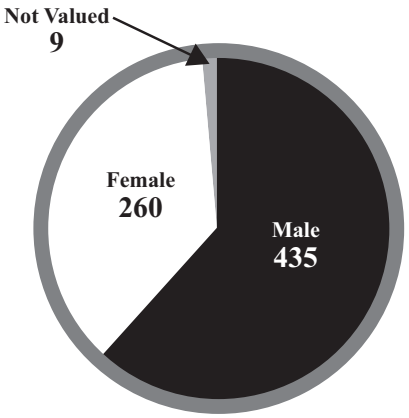
Final Disposition of Patients

Patients Aged 15 and Older Treated at Johns Hopkins Burn Center at Bayview
(3-Year Comparison)
Source: Maryland State Trauma Registry

Final Disposition	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Home	573	525	556
Home with Services	32	34	45
Transfer to Another Acute Care Facility	0	2	3
Discharged to Long-Term Care Facility	1	0	1
Discharged to Alternate Caregiver	0	1	0
Rehabilitation Facility	2	5	9
Skilled Nursing Facility	14	25	22
Psychiatric Hospital	5	8	10
Morgue/Died	17	12	16
Left Against Medical Advice or Discontinued Care	19	8	24
Jail	5	5	7
Hospice	2	2	4
Other	0	0	1
Not Valued	45	34	6
TOTAL	715	661	704

Gender Profile

Patients Aged 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
(June 2023 to May 2024)
Source: Maryland State Trauma Registry



Number of Injuries by Age

Patients Aged 15 and Older Treated at Johns Hopkins Burn Center at Bayview
(3-Year Comparison)
Source: Maryland State Trauma Registry

Age Range	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
15 to 24 years	102	83	105
25 to 44 years	267	281	266
45 to 64 years	253	195	214
65 years and over	93	102	110
Not Valued	0	0	9
TOTAL	715	661	704

MARYLAND PEDIATRIC TRAUMA STATISTICS

Legend Code	
Children's National Health System	CNHS
Johns Hopkins Pediatric Trauma Center	JHP

Total Cases Treated at Pediatric Trauma Centers

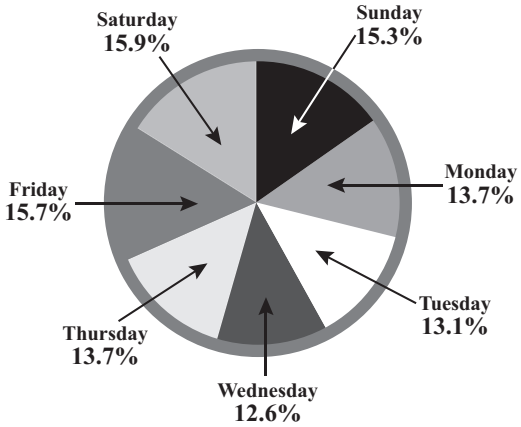
(3-Year Comparison)
Source: Maryland State Trauma Registry

Trauma Center	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
CNHS	911	849	977
JHP	894	1,026	1,184
TOTAL	1,805	1,875	2,161

Note: For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Health System data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

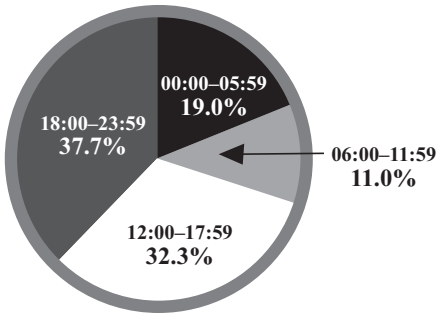
Emergency Department Arrivals by Day of Week: Children Treated at Pediatric Trauma Centers

(June 2023 to May 2024)
Source: Maryland State Trauma Registry



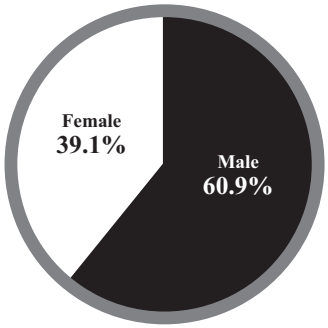
Emergency Department Arrivals by Time of Day: Children Treated at Pediatric Trauma Centers

(June 2023 to May 2024)
Source: Maryland State Trauma Registry



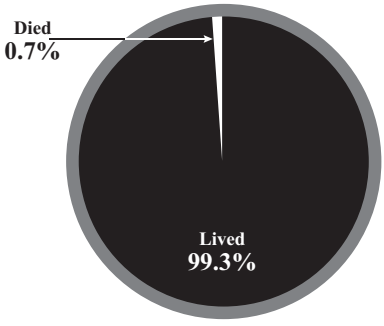
Gender Profile: Children Treated at Pediatric Trauma Centers

(June 2023 to May 2024)
Source: Maryland State Trauma Registry



Outcome Profile: Children Treated at Pediatric Trauma Centers

(June 2023 to May 2024)
Source: Maryland State Trauma Registry



Note: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children that were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Mode of Patient Transport by Center: Scene Origin Cases Only

Children Treated at Pediatric Trauma Centers
(June 2023 to May 2024)
Source: Maryland State Trauma Registry

Modality Type	CNHS	JHP	Total
Ground Ambulance	73.8%	57.4%	61.6%
Helicopter	15.8%	9.5%	11.1%
Other	10.4%	33.1%	27.3%
TOTAL	100.0%	100.0%	100.0%

Note: Only patients brought directly from the scene to a Trauma Center are included in this table. For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Origin of Patient Transport by Center

Children Treated at Pediatric Trauma Centers
(June 2023 to May 2024)
Source: Maryland State Trauma Registry

Origin	CNHS	JHP	Total
Scene of Injury	30.6%	72.3%	53.5%
Hospital Transfer	63.0%	22.6%	40.8%
Other	6.4%	5.1%	5.7%
TOTAL	100.0%	100.0%	100.0%

Note: For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Injury Type

Children Treated at Pediatric Trauma Centers
(3-Year Comparison)
Source: Maryland State Trauma Registry

Injury Type	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Blunt	86.5%	85.0%	87.2%
Penetrating	4.5%	5.0%	4.4%
Near Drowning	0.7%	1.1%	0.9%
Hanging	0.4%	0.3%	0.1%
Ingestion	0.1%	0.1%	0.0%
Crush	0.1%	0.1%	0.0%
Animal Bite/Human Bite	7.5%	8.3%	7.4%
Other	0.2%	0.1%	0.0%
TOTAL	100.0%	100.0%	100.0%

Note: For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Mechanism of Injury

Children Treated at Pediatric Trauma Centers
(3-Year Comparison)
Source: Maryland State Trauma Registry

Mechanism of Injury	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Cut/Stab	1.7%	1.8%	2.1%
Drowning/Submersion	0.4%	1.0%	0.7%
Falls	34.2%	30.9%	32.3%
Gun Shot Wound	2.4%	3.3%	2.3%
Machinery/Mechanical	0.5%	1.4%	0.9%
Motor Vehicle Crash	20.0%	19.6%	18.4%
Motorcycle Crash	1.3%	1.0%	0.8%
Bicycle Crash	4.5%	4.4%	4.1%
Pedestrian Incident	8.9%	8.5%	8.4%
Other Transport*	0.2%	0.0%	0.0%
Natural/Environmental	8.0%	8.7%	7.4%
Struck by Object	9.8%	9.9%	11.3%
Abuse	4.1%	5.7%	7.3%
Other	2.3%	1.9%	2.2%
Not Valued	1.7%	1.9%	1.8%
TOTAL	100.0%	100.0%	100.0%

*Note: *Injuries sustained in "Other Transport" include injuries while boating, using personal water craft, in airplanes, etc.*

For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Etiology of Injuries by Age

Children Treated at Pediatric Trauma Centers (June 2023 to May 2024)
Source: Maryland State Trauma Registry

Age	Motor Vehicle Crash	Motorcycle	Pedestrian	Fall	Gunshot Wound	Cut/Stab	Struck by Object	Bicyclist	Other	Total
Under 1 year	4.1%	0.0%	1.6%	15.7%	2.0%	0.0%	2.9%	0.0%	14.8%	9.2%
1 to 4 years	21.8%	0.0%	14.8%	27.5%	12.0%	19.6%	7.8%	4.5%	23.5%	20.6%
5 to 9 years	25.6%	11.8%	19.3%	31.2%	10.0%	17.4%	13.1%	37.1%	25.0%	25.2%
10 to 14 years	37.9%	70.6%	55.5%	19.9%	48.0%	36.9%	42.2%	47.2%	25.7%	32.6%
15+ years	10.6%	17.6%	8.8%	5.7%	28.0%	26.1%	34.0%	11.2%	11.0%	12.4%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note: For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Statistics.

Number of Injuries and Deaths by Age

Children Treated at Pediatric Trauma Centers
(June 2023 to May 2024)
Source: Maryland State Trauma Registry

Age	Number of Injured Patients		Number of Deaths	
	Total	Maryland Residents	Total	Maryland Residents
Under 1 year	204	193	2	2
1 to 4 years	446	423	6	5
5 to 9 years	538	512	4	3
10 to 14 years	703	672	3	3
15+ years	270	247	1	1
TOTAL	2,161	2,047	16	14

Note: For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Number of Injuries by Age

Children Treated at Pediatric Trauma Centers
(3-Year Comparison)
Source: Maryland State Trauma Registry

Age	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Under 1 year	185	166	204
1 to 4 years	365	395	446
5 to 9 years	490	501	538
10 to 14 years	596	606	703
15+ years	169	207	270
TOTAL	1,805	1,875	2,161

Note: For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Number of Deaths by Age

Children Treated at Pediatric Trauma Centers
(3-Year Comparison)
Source: Maryland State Trauma Registry

Age	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Under 1 year	5	5	2
1 to 4 years	2	2	6
5 to 9 years	7	4	4
10 to 14 years	4	7	3
15+ years	0	1	1
TOTAL	18	19	16

Note: For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Final Disposition of Patients

Children Treated at Pediatric Trauma Centers
(3-Year Comparison)
Source: Maryland State Trauma Registry

Final Disposition	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Inpatient Rehab Facility	1.7%	1.4%	1.8%
Residential Facility	0.1%	0.1%	0.0%
Specialty Referral Center	0.0%	0.0%	0.2%
Home with Services	0.9%	0.6%	0.5%
Home	94.7%	94.6%	94.5%
Acute Care Hospital	0.3%	0.5%	0.9%
Left Against Medical Advice	0.0%	0.1%	0.3%
Morgue/Died	1.0%	1.0%	0.7%
Left without Treatment	0.1%	0.0%	0.0%
Foster Care	0.6%	1.1%	0.7%
Jail	0.0%	0.2%	0.1%
Psychiatric Hospital	0.5%	0.3%	0.2%
Elopement	0.1%	0.1%	0.1%
TOTAL	100.0%	100.0%	100.0%

Note: For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Etiology of Injuries by Age

Children Treated at Pediatric Trauma Centers or Adult Trauma Centers (June 2023 to May 2024)
Source: Maryland State Trauma Registry

Age	Motor Vehicle Crash	Motorcycle	Pedestrian	Fall	Gunshot Wound	Cut/Stab	Struck by Object	Bicyclist	Other	Total
Under 1 year	4.5%	0.0%	2.2%	18.0%	4.5%	4.5%	4.6%	0.0%	16.8%	11.3%
1 to 4 years	23.5%	0.0%	16.9%	30.6%	18.2%	22.7%	15.4%	4.5%	27.4%	24.5%
5 to 9 years	29.0%	15.8%	23.5%	31.5%	11.4%	25.0%	18.5%	34.6%	27.6%	28.2%
10 to 14 years	43.0%	84.2%	57.4%	19.9%	65.9%	47.8%	61.5%	60.9%	28.2%	36.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note: Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Occurrence of Injury by County: Scene Origin Cases Only

Children Treated at Pediatric Trauma Centers
(June 2023 to May 2024)
Source: Maryland State Trauma Registry

County of Injury	Number
Anne Arundel County	71
Baltimore County	195
Calvert County	11
Caroline County	5
Carroll County	24
Cecil County	5
Charles County	27
Dorchester County	3
Frederick County	18
Harford County	37
Howard County	36
Kent County	3
Montgomery County	60
Prince George's County	151
Queen Anne's County	8
St. Mary's County	19
Talbot County	5
Washington County	9
Wicomico County	4
Worcester County	8
Baltimore City	422
Virginia	1
West Virginia	1
Washington, DC	11
Delaware	1
Other	1
Not Valued	20
TOTAL	1,156

Note: For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. Scene origin cases represent 53.5% of the total cases treated at Pediatric Trauma Centers. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Residence of Patients by County: Scene Origin Cases Only

Children Treated at Pediatric Trauma Centers
(June 2023 to May 2024)
Source: Maryland State Trauma Registry

County of Residence	Number
Anne Arundel County	73
Baltimore County	196
Calvert County	13
Caroline County	4
Carroll County	18
Cecil County	5
Charles County	19
Dorchester County	4
Frederick County	16
Harford County	34
Howard County	38
Kent County	2
Montgomery County	63
Prince George's County	138
Queen Anne's County	7
St. Mary's County	16
Somerset County	1
Talbot County	4
Washington County	7
Wicomico County	4
Worcester County	2
Baltimore City	427
Virginia	12
West Virginia	2
Washington, DC	29
Pennsylvania	5
Delaware	3
Other	14
TOTAL	1,156

Note: For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. Scene origin cases represent 53.5% of the total cases treated at Pediatric Trauma Centers. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

Children with Protective Devices at Time of Trauma Incident

Children Treated at Pediatric Trauma Centers
(3-Year Comparison)
Source: Maryland State Trauma Registry

Protective Device	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
None	45.8%	46.2%	49.5%
Seatbelt	3.9%	2.9%	3.7%
Airbag & Seatbelt	18.9%	16.5%	15.3%
Airbag Only	9.9%	11.3%	10.4%
Infant/Child Seat	10.9%	12.2%	10.1%
Protective Helmet	10.2%	10.3%	10.6%
Padding/Protective Clothing	0.2%	0.3%	0.3%
Other Protective Device	0.2%	0.3%	0.1%
TOTAL	100.0%	100.0%	100.0%

Note: Children were involved in motor vehicle, motorcycle, bicycle, and sports-related incidents only. For children who were treated at Adult Trauma Centers, see Maryland Adult Trauma Statistics. Children's National Hospital data include patients residing in Maryland and/or injured in Maryland. For children who were burn patients at each hospital, see Maryland Pediatric Burn Center Statistics.

MARYLAND PEDIATRIC BURN STATISTICS

Total Number of Pediatric Burn Cases

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (3-Year Comparison)
Source: Maryland State Trauma Registry

Institution	Legend Code	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Children's National Health System Pediatric Burn Center	CNHSPBC	263	233	245
Johns Hopkins Pediatric Burn Center	JHPBC	320	380	418
Johns Hopkins Burn Center at Bayview	JHBC	41	44	44
TOTAL		624	657	707

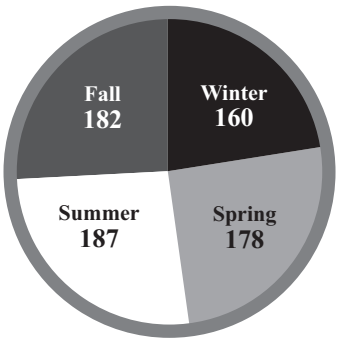
Place of Injury

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

Place of Injury	Number
Non-Institutional Private Residence	618
Residential Institution	1
School, Other Institution and Public Administrative Area	12
Sport and Athletic Areas	1
Street/Highway	6
Trade and Service Area	7
Other Places	20
Unspecified Places	42
TOTAL	707

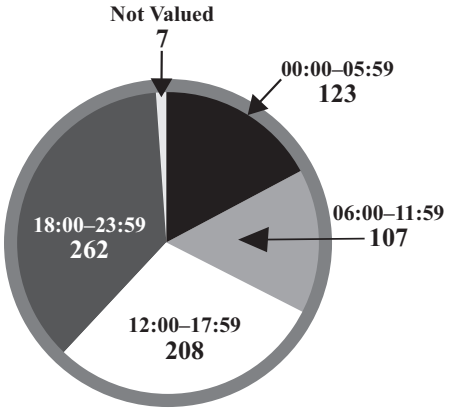
Season of Year Distribution

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry



Time of Arrival Distribution

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry



Occurrence of Injury by County

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

County of Injury	Number
Anne Arundel County	54
Baltimore County	89
Calvert County	10
Caroline County	2
Carroll County	6
Cecil County	8
Charles County	19
Dorchester County	5
Frederick County	15
Harford County	28
Howard County	25
Montgomery County	73
Prince George's County	113
Queen Anne's County	1
St. Mary's County	12
Somerset County	2
Talbot County	1
Washington County	9
Wicomico County	6
Worcester County	2
Baltimore City	163
Virginia	5
West Virginia	7
Pennsylvania	9
Washington, DC	2
Delaware	2
Other	1
Not Valued	38
TOTAL	707

Residence of Patients by County

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

County of Residence	Number
Anne Arundel County	57
Baltimore County	105
Calvert County	10
Caroline County	2
Carroll County	9
Cecil County	9
Charles County	16
Dorchester County	6
Frederick County	16
Harford County	29
Howard County	28
Montgomery County	72
Prince George's County	115
Queen Anne's County	1
St. Mary's County	12
Somerset County	3
Tablot County	1
Washington County	9
Wicomico County	7
Baltimore City	167
Virginia	7
West Virginia	8
Washington, DC	1
Pennsylvania	7
Delaware	2
Other	7
Not Valued	1
TOTAL	707

Mode of Patient Transport to Burn Center

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

Origin Type	CNHSPBC	JHPBC	JHBC	Total
Ground Ambulance	77	165	3	245
Helicopter	5	7	0	12
Other*	162	244	41	447
Not Valued	1	2	0	3
TOTAL	245	418	44	707

**Note: The category "Other" includes patients who were brought in by fixed wing ambulance, private or public vehicles, or were walk-ins.*

Origin of Patient Transport by Burn Center

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

Origin Type	CNHSPBC	JHPBC	JHBC	Total
Scene of Injury	100	168	21	289
Hospital Transfer	79	179	0	258
Other	65	54	22	141
Not Valued	1	17	1	19
TOTAL	245	418	44	707

Etiology of Injury by Age of Patients

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

Age Range	Electrical	Chemical	Thermal			Inhalation	Other Burn	Unknown	Total
			Flame	Contact	Scald				
Under 1 year	0	0	0	23	38	0	0	3	64
1 to 4 years	3	2	13	153	173	0	6	16	366
5 to 9 years	2	0	16	64	52	3	4	7	148
10 to 14 years	1	2	19	28	37	0	2	4	93
15 years and over	0	1	4	13	14	1	0	3	36
Total	6	5	52	281	314	4	12	33	707

Final Disposition of Patients

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (3-Year Comparison)
Source: Maryland State Trauma Registry

Final Disposition	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Home	584	608	650
Home with Services	14	15	26
Transfer to an Acute Care Facility	10	14	11
Rehabilitation Facility	4	1	3
Morgue/Died	4	4	3
Left Against Medical Advice	0	7	4
Alternate Caregiver	3	2	2
Foster Care	2	5	0
Transfer to Inpatient Psychiatric Facility	2	1	1
Not Valued	1	0	7
TOTAL	624	657	707

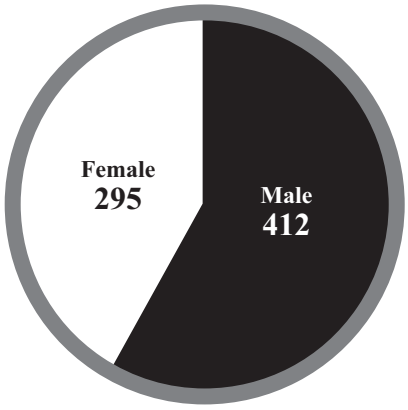
Total Body Surface Area (TBSA) Burned by Length of Stay in Days

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry

Length of Stay	Less Than 10% TBSA	10 - 19% TBSA	20% or Greater TBSA	Not Valued	Total
1 Day	477	7	3	65	552
2 - 3 Days	54	4	0	6	64
4 - 7 Days	16	5	0	7	28
8 - 14 Days	14	9	1	3	27
15 - 21 Days	4	1	1	2	8
22 - 28 Days	3	1	0	1	5
Over 28 Days	0	1	3	0	4
Not Valued	14	0	3	2	19
TOTAL	582	28	11	86	707

Gender Profile

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2023 to May 2024)
Source: Maryland State Trauma Registry



Number of Injuries by Age

Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (3-Year Comparison)
Source: Maryland State Trauma Registry

Age Range	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Under 1 year	69	52	64
1 to 4 years	307	321	366
5 to 9 years	137	156	148
10 to 14 years	76	93	93
15 years and over	35	35	36
TOTAL	624	657	707

Number of Patients Treated at the Pediatric Burn Clinics at Johns Hopkins Pediatric Center and Children's National Hospital

(3-Year Comparison)
Source: Maryland State Trauma Registry

	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Unique Patients	790	767	817
Total Pediatric Burn Clinic Visits	1,548	1,483	1,486

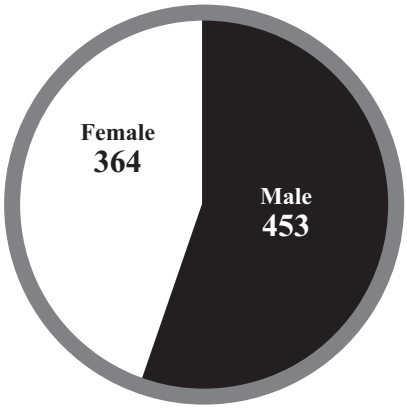
Number of Patients by Age Treated at the Burn Clinics at Johns Hopkins Pediatric Center and Children's National Hospital

(3-Year Comparison)
Source: Maryland State Trauma Registry

Age Range	June 2021 to May 2022	June 2022 to May 2023	June 2023 to May 2024
Under 1 year	77	69	61
1 to 4 years	399	377	409
5 to 9 years	165	170	180
10 to 14 years	105	102	117
15 years and over	44	49	50
TOTAL	790	767	817

Gender Profile

Patients Treated at the Pediatric Burn Clinics at Johns Hopkins Pediatric Center and Children's National Hospital (June 2023 to May 2024)
Source: Maryland State Trauma Registry



Etiology of Injuries by Age

Patients Treated at the Pediatric Burn Clinics
At Johns Hopkins Pediatric Center and Children's National Medical Center (June 2023 to May 2024)
Source: Maryland State Trauma Registry

			Thermal			Other	Other		
Age Range	Electrical	Chemical	Flame	Contact	Scald	Burn	Non-Burn	Unknown	Total
Under 1 year	0	0	1	25	34	1	0	0	61
1 to 4 years	1	2	13	183	199	2	0	9	409
5 to 9 years	1	0	16	88	66	4	0	5	180
10 to 14 years	1	1	11	48	52	2	0	2	117
15 years and over	1	2	4	20	18	1	1	3	50
Total	4	5	45	364	369	10	1	19	817

EPILOGUE

Consistent with Maryland law and guided by the Vision 2030 as our roadmap, MIEMSS strives to fulfill its mission of reducing preventable deaths, disability, and discomfort among the citizens and visitors of Maryland. For questions regarding any of MIEMSS' services and functions please visit www.MIEMSS.org.

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LIEUTENANT GOVERNOR
Aruna Miller

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Stephan Cox

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SEMSAC Chairman
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Vacant

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MARYLAND EMS
A SYSTEM SAVING LIVES