



Maryland Institute for Emergency Medical Services Systems



2012 - 2013 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, conducts and/or 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 EMS Operations Fund, developing and promulgating regulations and protocols, proposing EMS system legislation, licensing/certifying and disciplining EMS providers, 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.



2012–2013 ANNUAL REPORT

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Mission/Vision/Key Goals

MISSION

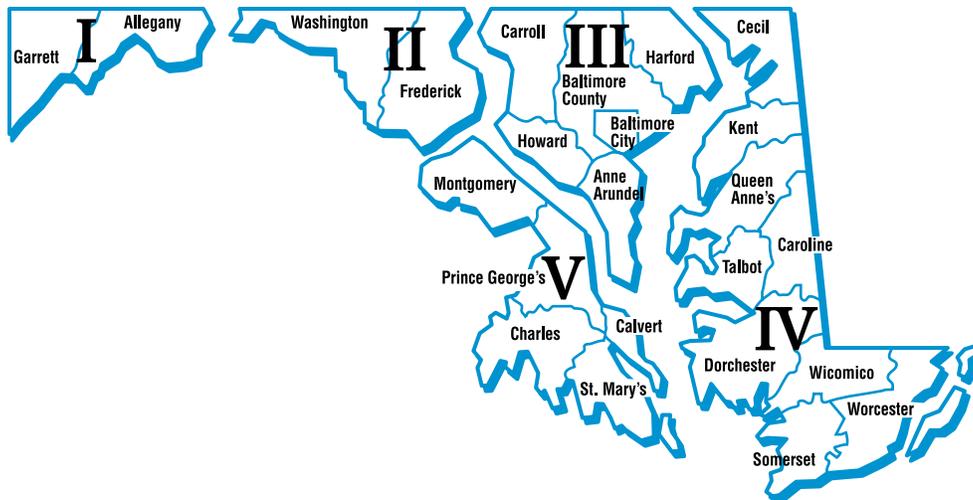
Consistent with Maryland law and guided by the EMS Plan, to provide the resources (communications, infrastructure, grants, and training), leadership (vision, expertise, and coordination), and oversight (medical, regulatory, and administrative) necessary for Maryland's statewide emergency medical services (EMS) system to function optimally and to provide effective care to patients by reducing 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 quality care.

KEY GOALS

- Provide high quality medical care to individuals receiving emergency medical services.
- Maintain a well-functioning emergency medical services system.





Donald L. DeVries, Jr., Esq.
Chairman, EMS Board

FROM THE EMS BOARD CHAIRMAN

*T*his 2012-2013 Annual Report marks the 20th anniversary of the creation of the system of governance, oversight, and coordination for Maryland's Statewide EMS System. In 1992 the Governor's EMS Commission, charged with preparing the EMS system for "entry into the 21st century," recommended a formalized structure for a statewide EMS system. The Commission's recommendations were turned into a statutory framework in 1993, which has resulted in the ongoing and successful operation of Maryland's Statewide EMS System.

Significant changes in our EMS system have occurred over the past 20 years. Some of the most notable include:

- Ongoing licensing and certification of nearly 30,000 EMS providers, many of whom are volunteers, as well as a peer-reviewed credentialing processes with appeal rights for disciplinary issues; establishment of web-based services for EMS providers, including implementation of a successful internet-based EMS prehospital patient care record system, tracking of licensure/certification status, and provider education; and online continuing education and protocol update information, making it easier for providers to maintain requirements of licensure/certification.
- Statewide application of uniform medical protocols for EMS providers, along with regular protocol updates so that EMS can provide the most current and effective treatment to critically ill and injured patients during the prehospital emergency phase of care.
- A comprehensive and expanded structure for designation of trauma and specialty centers that includes neurotrauma and eye trauma centers, burn centers, primary and comprehensive stroke centers, cardiac interventional centers, and perinatal referral centers. Designation standards are periodically updated to reflect national standards.
- Ongoing operation of one of the largest medical communications systems, which links all components of the prehospital care system and encompasses communications towers, microwave radios, EMS and helicopter communications, and hospital consoles.

Yet even at this 20-year mark our EMS system remains a work in progress. During the past year, the first of the new helicopter fleet was delivered to the Maryland State Police Aviation Command. The delivery of the new helicopters is the culminating event in a multi-year effort to secure a replacement fleet; the hard work of many individuals and entities led to this achievement.

Also in FY 2013, the financial stability of the statewide EMS system was secured for the near future by an increase in the vehicle registration fee surcharge that funds many components of the system. Ensuring the availability of the financial support needed by our EMS system was a significant goal, the attainment of which will enable critically-needed updates to our communications system.

Maryland's EMS System remains unique in the nation as a community of volunteer and career organizations and personnel; police, fire departments, and fire/EMS and "third service" providers; trauma and specialty centers; health care providers; 9-1-1 services and operators; and state, county, and local governments and jurisdictions. Our successes are due to the hard work and dedication of our many partners, and the spirit of cooperative excellence that is so evident in their efforts. I am confident that our Statewide EMS System will continue to improve and meet the needs of Marylanders throughout the state. On behalf of the EMS Board, I thank you for your extraordinary efforts over the past 20 years and pledge to continue to ensure that Maryland's EMS system remains a model for the country.



*Robert R. Bass, MD, FACEP
Executive Director, MIEMSS*

MIEMSS

FROM THE EXECUTIVE DIRECTOR

Each year, the MIEMSS Annual Report details the noteworthy progress achieved by Maryland's Statewide EMS System as it continues to grow and evolve to meet new challenges. The 2012-2013 Annual Report is no exception and describes the accomplishment of several impressive milestones during the past year.

The successful passage of legislation to ensure the financial solvency of the Maryland EMS Operations Fund (MEMSOF) was an achievement critical to the ongoing and future operation of the Statewide EMS System. The modest \$3.50 annual increase to the vehicle registration fee surcharge that was approved by the Legislature will yield an estimated additional \$4 million annually to the MEMSOF. These funds will benefit the operation of the Statewide EMS System in a number of ways. Notably for MIEMSS, the additional funding will help secure a new communications system, replacing aging equipment used by the EMRC and SYSCOM in our Communications Center in Baltimore. The new communications system will use Internet Protocol (IP)-based technology that will lower the risk of equipment failure, reduce operational costs, provide the ability to remotely manage equipment and interconnections, and interface with the State's 700 MHz radio system.

Delivery of the first of the new AgustaWestland 139 (AW-139) helicopters to the Maryland State Police (MSP) Aviation Command earlier this year was a long-awaited and much-anticipated event and a significant milestone for the EMS system. The AW-139 helicopters replace the soon-to-be-retired Eurocopter 365N Dauphin fleet that has served the state admirably for more than two decades. The new AW-139 helicopters are larger and faster and will be staffed by two EMS providers and two pilots. The changeover to the new fleet has already begun and will continue throughout upcoming year, as the MSP Aviation Command implements the transition on a section-by-section basis.

Also during the year, MIEMSS increased efforts to promote new, more effective approaches to emergency treatment. MIEMSS' Cardiac Arrest Steering Committee focused on addressing improvements to the treatment of sudden cardiac arrest, including dispatch-directed cardiopulmonary resuscitation (CPR), high performance CPR for EMS providers, and improved citizen access to CPR training and automated external defibrillators (AEDs). These initiatives hold much promise for increasing survival from sudden cardiac arrest, as evidenced by improved patient survival statistics resulting from adoption of these approaches in Howard County.

MIEMSS also designated Maryland's first Comprehensive Stroke Center, which provides the full spectrum of care needed to treat the most complex stroke cases and supports the 35 Primary Stroke Centers throughout the state. We also worked hand-in-hand with jurisdictions to provide guidance on acceptable medication alternatives as EMS grapples with problematic medication shortages that are affecting many sectors of the healthcare system. Additionally, MIEMSS continued a leadership role in the advancement of telemedicine in Maryland, particularly as it is used in the emergency phases of hospital care for cardiac and stroke patients. These and the other initiatives detailed within these pages will continue as Maryland's EMS system progresses and evolves.

Finally, this year's Annual Report marks a personal milestone for me as I retire from my position as MIEMSS Executive Director at the end of this calendar year. I have been extraordinarily fortunate to have had the opportunity to lead MIEMSS and the Statewide EMS System and to work with the EMS Board on many issues. As I look back over the past 20 years since my arrival, I am proud of the many accomplishments that we have worked together to achieve, but I am even prouder of how you have always accepted and overcome the challenges that inevitably are associated with progress. As has often been said, it takes a system to save a life, and I believe that we have collectively made a difference in the lives of many people. I thank you for the opportunity to have served you, for your support, and above all, for your friendship.

MIEMSS

ADMINISTRATION

Mission: To provide comprehensive accounting, personnel, and administrative resources in compliance with all applicable State laws, regulations, and policies in support of MIEMSS operations and overall mission.

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

The Accounting Unit provides guidance to management on various fiscal and budgetary matters. The staff develops the budget, tracks and monitors expenditures, processes accounts payables and receivables, maintains employee leave records, processes payroll, and deposits cash receipts. They also administer special, federal grant, and reimbursable fund appropriations.

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 unit is also responsible for contract and grant administration.

The Personnel Unit coordinates all areas of human resources for MIEMSS. This includes setting policy and procedural guidelines to ensure compliance with State personnel laws and regulations. The staff of this unit is responsible for recruitment and hiring, salary determination, position classification and promotion, benefits and retirement coordina-

tion, employee assistance, ADA compliance, and the employee evaluation process.

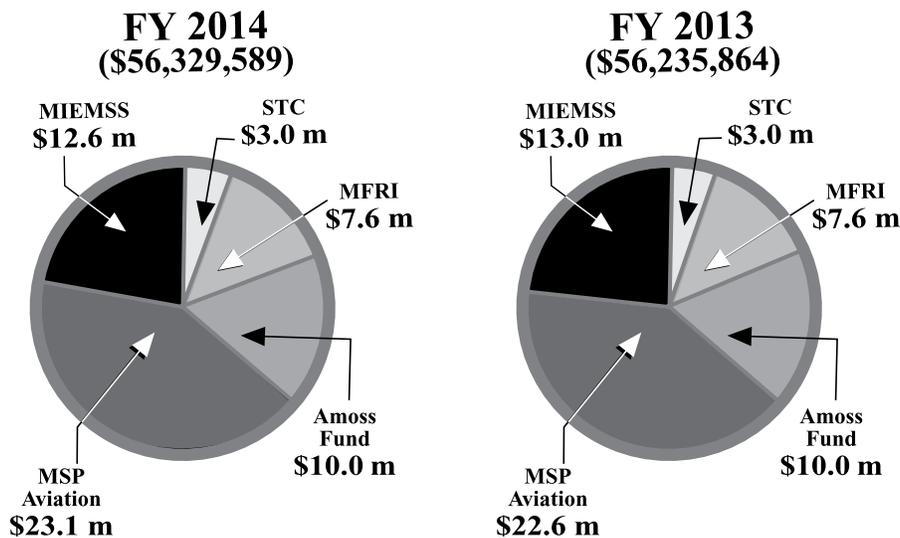
Administration is also responsible for inventory control, fleet management, travel services, and building operations and maintenance.

MIEMSS budget information is displayed by state object code and department in the charts below.

MIEMSS FY 2013 Expenditure by Object Code (Includes All Funds)

FY 2013	Actual
Salaries and Wages	\$8,128,256
Technical/Special Fees	608,326
Communication	826,416
Travel	180,463
Fuel and Utilities	105,807
Motor Vehicle Operations and Maintenance	240,081
Contractual Services	2,306,743
Supplies and Materials	263,621
Equipment—Replacement	105,826
Equipment—Additional	145,234
Fixed Charges	103,701
Grants	927,826
Total Expenditure	\$13,942,300

EMS Operations Fund



MFRI = Maryland Fire & Rescue Institute
 STC = R Adams Cowley Shock Trauma Center
 MSP = Maryland State Police



AEROMEDICAL OPERATIONS

Mission: To provide the physician medical support necessary to the Maryland State Police Aviation Command in order to meet the emergency helicopter needs of Maryland's citizens. The State Aeromedical Director is actively involved in ongoing training and verification of skill proficiency for State Police flight paramedics. He provides around-the-clock consultation support to Systems Communications (SYSCOM) for medevac requests and medical direction and is actively involved in the development of new patient care protocols and the oversight of ongoing care.

In FY 2012 there were 2,450 patients transported by the Maryland State Police (MSP) Aviation Command. Of these patients, 2,414 (98%) were transported from the scene of injury at the request of the local emergency services and 36 (2%) were transported between hospitals to a higher level of care.

Types of calls included the following:

• Motor vehicle crashes	1,006
• Falls	600
• Pedestrians	135
• Assaults	64
• Burns	53
• Gunshot wounds	51
• Stabbings	47
• Industrial accidents	39

Fiscal Year 2013 was a very exciting year for the Aviation Command as they began to take delivery of ten new AgustaWestland 139 (AW-139) helicopters. These new aircraft utilize the most current safety technology, as recommended by the National Transportation Safety Board, and are powerful enough to carry two patients and two EMS providers despite the challenging heat and humidity of the summer months. The new AW-139s replace the current aging fleet of Dauphin helicopters, which are entering their 25th year of use.

The Aviation Command continued its participation in the Adult and Pediatric Rapid Sequence

Intubation (RSI) pilot programs. Designed to address the needs of patients with severe head injuries, these RSI pilot protocols allow MSP flight paramedics to use neuromuscular blocking agents in the field to provide endotracheal intubation for patients who are not breathing adequately. Scenario-based simulation training was utilized for MSP flight paramedics in verification of advanced skill proficiency. These exercises, also used for recertification in Pediatric Advanced Life Support (PALS), allowed life-like simulation of patient care situations as would be faced by flight paramedics in the course of their normal duties.

ATTORNEY GENERAL'S OFFICE

Mission: To provide 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 commercial ambulance services. The Attorney General's Office also serves as the administrative prosecutor for cases involving allegations of prohibited acts by EMS providers before the EMS Provider Review Panel, the EMS Board, the Office of Administrative Hearings, and the courts.

During the past fiscal year, the Attorney General's Office continued to support MIEMSS in promulgating and implementing the agency's regulations, procurement, and contracts, including technology initiatives. The office also assisted in the administration of several state and federal grant programs.

The Attorney General's Office reviewed and prosecuted 37 cases of alleged prohibited acts by EMS providers and applicants. The office staff also provided legal advice and support to the State Office of Commercial Ambulance Licensing and Regulation in all compliance matters, including contested cases. In addition, responses were prepared to 25 public information act requests, 1 subpoena, and 7 research requests.

In FY 2013 the Attorneys General worked with MIEMSS to review and revise various regulations, including Specialty Care Transport and Neonatal Transport regulations for commercial ambulance services, and provided support to MIEMSS during the legislative session.

With the support of the Attorneys General, MIEMSS participated in the statewide transition to the Maryland Orders for Life Sustaining Treatment (MOLST) form. (See page 8 for more information on this program.)

The office participated in drafting several information technology procurements, including agreements to host certain MIEMSS data offsite, software maintenance agreements, creation of a state automated external defibrillator (AED) registry, building security, redesign and update of the EMRC/SYSCOM facility, and several business associate agreements under the Health Insurance Portability and Accountability Act (HIPAA). Other tasks completed in FY 2013 included providing advice on MIEMSS social media policy, drafting a National Emergency Medical Services Information System (NEMSIS) data sharing agreement, drafting agreements for designation of out-of-state medical facilities, and reviewing and providing advice concerning designation of trauma and specialty centers.

On June 11, 2013, the Attorney General's Office obtained registration, as a service mark on the principal register of the US Patent and Trademark Office, of "eMEDS[®]," a prehospital data reporting system procured and supplied to Maryland EMS Operational Programs by MIEMSS.

In FY 2013 the Attorneys General prepared an agency HIPAA training program; made educational presentations at several venues, including EMS Care 2013, the Medical Directors' Symposium, Advanced Disaster Life Support training, Quality Assurance Officer's Training, Pyramid, and MOLST educational forums; and wrote several articles for MIEMSS' EMS newsletter, *Maryland EMS News*.

COMMUNICATIONS ENGINEERING SERVICES

Mission: To provide the equipment, support, and expertise necessary to operate the Statewide EMS communications systems and to support public safety interoperability.

Fiscal year 2013 saw the successful completion of several critical multi-year projects for Communications Engineering Services as well as the completion of infrastructure enhancements to allow for greater system resilience and reliability. In addition, the multi-year project to transform EMS communications from analog to IP-based systems was kicked off with an initiative to update our EMRC/SYSCOM Communications Center.

In December 2012, one month before the federally-mandated narrowbanding deadline, MIEMSS communications ceased wideband radio operations. This was the culmination of six years of planning, purchasing, and implementation needed to meet the

Federal Communications Commission's (FCC's) unfunded narrowbanding mandate. Communications Engineering Services purchased and deployed over 263 Radio Frequency Base Stations at 78 communications sites across Maryland. The transition was accomplished through a phased regional approach starting with Region IV Emergency Medical Resource Center (EMRC), followed by Regions I and II, then Region V, and concluding with Region III. New narrowband subscriber equipment was provided to field providers through a 100% reimbursable grant program. In conjunction with the effort to meet the FCC mandate, this department was also able to meet the long-term goal of Regional EMRC coverage for all Maryland counties.

MIEMSS secured funding in FY 2012 to address a key vulnerability in the EMS communications system. A single 1800 pair cable connecting our EMRC/SYSCOM communications consoles, phones, and patching systems to the microwave and phone hub at the Bressler Research Building, located two blocks from MIEMSS' headquarters on Pratt Street in Baltimore, had been at risk for severe damage. The loss of this cable would have caused the majority of EMS communications services provided by MIEMSS to cease. The construction of the new tower at the R Adams Cowley Shock Trauma Center, University of Maryland produced several near misses to this critical communications cable. In order to eliminate this vulnerability, the department created a fault-tolerant SONET Ring utilizing existing fiber and a new 11 GHz microwave hop between the MIEMSS and Bressler buildings. This SONET Ring allows for the immediate and seamless re-route of all of our critical EMS communications traffic and significantly increases the survivability of MIEMSS communications services. The relocation of all circuits to this fault-tolerant infrastructure was completed in February 2013.

Communications Engineering Services continues to lead in the design, implementation, and maintenance of the Statewide Public Safety Microwave System, which supports all the state agencies and many of the county radio systems. The department has continued its partnership role with other state agencies by designing and implementing communication circuits in support of MIEMSS, the Maryland State Police (MSP), the Maryland Department of Natural Resources (DNR), Maryland State Highway Administration (SHA), county radio systems, and many other state and federal partners including the statewide Maryland First responders Interoperable

Radio System Team (MFiRST) 700 MHz radio project. MIEMSS continues to play a leadership role in the day-to-day maintenance of the Public Safety Microwave System.

The department has continued to address vulnerabilities within MIEMSS headquarters that were identified in an internal review and consultant's report in FY 2011. In FY 2013 multiple package air conditioner units were added to the Server/Radio Room and made operational. Many improvements have been designed, implemented, and installed by our Communications Engineer, Robert Chamberlin.

MIEMSS continues to be an active partner in the State's 700 MHz radio system initiative. Communications Engineering Services participates in the Statewide Interoperability Executive Committee (SIEC) Technical Committee and is overseeing the design objectives and contractors in the build-out of Phase 2, which is expected to be completed in 2014. MIEMSS is currently involved in the design and planning of Phase 3 of the MFiRST system. MIEMSS personnel were key players in the site surveys conducted in central Maryland that were necessary to allow the design phase of Phase 3 to proceed. Because the MIEMSS-operated communications centers (SYSCOM, Region III EMRC, Region IV EMRC, and Region V EMRC) have been identified as part of Phase 2 of the project, the department has been active in the specific technical design needed to interface these EMS communications systems into the 700 MHz system. These interfaces will allow MIEMSS to directly interoperate with the 700 MHz system in support of MSP Aviation Command (MSPAC) helicopters and allow all field providers the ability to obtain medical direction while using a 700 MHz radio.

In August 2012 Maryland submitted and received a FCC waiver allowing the use of 700 MHz narrowband secondary trunking channels. This waiver reads in part, *"By this Order, the Public Safety and Homeland Security Bureau (PSHSB or Bureau) grants a petition for waiver of the Commission's rules filed by the State of Maryland (Maryland) requesting authorization to use 700 MHz narrowband secondary trunking channels (secondary trunking channels) for air-to-ground interoperable radio communications. Maryland seeks to use the 700 MHz narrowband secondary trunking channels for air-to-ground interoperable communications in conjunction with its MFiRST system, a statewide inter-governmental 700 MHz public safety narrowband network, and the Maryland State Police-Maryland Institute for Emergency Medical Services (MSP-MIEMSS) emergency medical system."* A partnership among MFiRST, MSP, and MIEMSS

was created to develop a strategy that would implement one base station location to test the viability of 700 MHz frequencies. If successful, the 700 MHz frequencies would replace the aging lowband radio system used by the MSPAC helicopter fleet for command and control and physician consultation. This waiver allowed for successful testing from the new Dundalk Tower's 700 MHz conventional air-to-ground base station, and feedback has been supplied to the FCC. Because no coordinated system exists today, this proposed air-to-ground system and the frequencies given to Maryland under the FCC waiver could become a model for public safety air operations. This new system will also allow the MSPAC helicopter fleet and MIEMSS operations to more fully interoperate with the MFiRST radio system. While deployment of this system will not be completed until 2016, we have seen significant progress in the development of the MFiRST aviation solution.

Communications Engineering Services continues to lead in the deployment, administration, and maintenance of the Public Safety Interoperability network (PSInet), a statewide, private IP-based public safety network composed of fiber, microwave, and wireless links supporting critical data and voice communications managed by MIEMSS. Funding sources have included Public Safety Interoperable Communications (PSIC) grants, Urban Area Security Initiative (UASI) grants, MIEMSS operating funds, the MFiRST project, the Maryland Department of Health and Mental Hygiene, and local interoperability project funds. It is a network deployed to MSP Barracks, MIEMSS regional operating centers, jurisdictional emergency operations centers (EOCs) and primary/back-up public safety answering points (PSAP/9-1-1), state and jurisdictional health departments, hospitals, and other allied agencies. Interoperability applications that currently are operating on PSInet include: MFiRST, Digital Emergency Medical Services Telephone (DEMSTEL), Central Maryland Area Radio Communications (CMARC), Maryland Eastern Shore Interoperability Network (MESIN), Washington-Allegany-Garrett Interoperable Network (WAGIN), Coordinated Highways Action Response Team (CHART), Maryland Incident Management Interoperability Communications System (MIMICS), Maryland Law Enforcement Information Network (MLEIN), and systems monitoring/controlling the state's public safety microwave network and tower infrastructure.

The PSIC grant that funded the deployment of IP-enabled devices and connectivity to key public safety locations throughout the state was exhausted at the end of FY 2012. Funded through this grant,

Communications Engineering Services was able to deploy wireless links, routers, switches, and IP phones throughout the state with the goal of establishing PSInet connectivity and deploying DEMSTEL to every hospital, county PSAP, and county EOC. Although grant funding has ceased, MIEMSS has continued to expand PSInet and DEMSTEL to targeted key public safety locations. The department continues to seek funding sources to complete connectivity to all the identified public safety assets in Maryland. To date the department has deployed DEMSTEL and PSInet to 76 hospital locations, 19 law enforcement locations, 57 health locations, 60 emergency management locations, and 2 transportation locations.

Many other notable system enhancements and projects were completed in FY 2013:

- A new tower was completed at the Westernport location and MIEMSS implemented UHF base stations and microwave connectivity in support of Western Maryland EMRC operations and Allegany County PSAP radio systems. Radio coverage in this area had been limited since the original guyed tower fell during a storm several years ago.
- MIEMSS purchased equipment and supported the expansion of WAGIN, providing a greater footprint of interoperable communications in these counties.
- MIEMSS made system enhancements in support of the CMARC radio system to create greater network reliability.
- Department personnel assisted the DNR with the deployment of TAC Stack Radios and radar as part of MLEIN to monitor the Chesapeake Bay and tributaries, enhancing maritime security.
- MIEMSS agency-wide inventory assessment was completed, including inventory retained by approximately 200 communications sites and 50 hospitals.

Fiscal year 2013 presented many challenges to Communications Engineering Services, including severe thunderstorms immediately following the *derecho* in June 2012 and Hurricane Sandy in October 2012. These storms challenged not only the power grid, but also our communications infrastructure and our ability to respond to simultaneous outages across the state. Our ability to keep the systems operational and restore service quickly is due in no small part to our dedicated staff of maintenance technicians, managers, and support staff. At this time, the department is still seeking a qualified individual to fill the remaining Network Specialist position. Despite the

work force shortages, the department was successful in completing many important projects. We look ahead to the future as we continue to migrate our systems to new technologies that allow them to be more resilient and enhance the services we provide to the EMS community.

COMPLIANCE OFFICE

Mission: To ensure the health, safety, and welfare of the public as it relates to the delivery of EMS by EMS providers throughout Maryland.

To that end, the Compliance Office is responsible for ensuring quality of care by investigating complaints and allegations of prohibited conduct.

The Compliance Office works closely with the EMS Board, the Attorney General's Office, the Incident Review Committee (IRC), and the Provider Review Panel (PRP). The PRP is a 13-member panel comprised of physicians representing the Maryland Board of Physicians, Maryland Medical Chirurgical Society, and EMS Operational Program Medical Directors; all levels of EMS providers are also represented. The PRP reviews complaints, as well as the results of the investigations conducted by the Compliance Office, and recommends to the EMS Board any further action. The State EMS Medical Director and MIEMSS' Executive Director serve as ex-officio members on the PRP.

Compliance Office Activity Report in FY 2013

• Criminal Background Investigations Completed	9,792
• Incidents Reported to IRC	199
• IRC Investigations Initiated	155
• IRC Investigations Conducted	151
• IRC Investigations (FY 2012) Continued	48
• IRC Complaints Forwarded to PRP	37
• Complaints Dismissed by PRP	0
• Complaints Forwarded to EMS Board	37
• Complaints Requiring Service	0

EMS Board Action

• Reprimands	3
• Probation	20
• Suspensions	0
• Revocations	1
• Remedial training	3
• Surrenders	1
• Evaluations	0
• Applications Denied	3
• Case Resolution Conferences	8

• Dismissed	2
• Counseling	1
• Rehab	0
• Random Testing	16
OAH Hearings Requested	8
OAH Hearings Conducted	2
OAH Hearings Defaulted	0

DO NOT RESUSCITATE PROGRAM

The focus of the Do Not Resuscitate (DNR) Program this year has been the transition to Maryland Orders for Life-Sustaining Treatment (MOLST), which incorporated and replaced the EMS/DNR form.

The MOLST form may be downloaded by the public for use, and MIEMSS continues to provide copies to individuals without access to the internet. MIEMSS also provides plastic bracelets for use with any MOLST insert to the public, free of charge. Additionally, the EMS/DNR program routinely responds to phone calls and emails from the public for assistance in obtaining and using the MOLST form.

MIEMSS staff continues to participate in educational programs regarding MOLST and published articles about the MOLST form in the December 2012 and January 2013 editions of *Maryland EMS News*, MIEMSS' monthly newsletter.

EDUCATIONAL SUPPORT SERVICES

Mission: To contribute to MIEMSS' vision of eliminating preventable death and disability by providing to the public essential information on how to recognize an emergency, summon an EMS response, and incorporate injury prevention methods in their daily lives, as well as designing and developing educational programs for EMS providers through state-of-the-art technology.

Educational Support Services provides education and information to Maryland's EMS community and the public through various modes of media and communication. The office develops, designs, and produces instructional training modules and informative programs that are distributed statewide.

This office is responsible for the design, photography, and editorial content of the MIEMSS Annual Report, MIEMSS website, and the *Maryland EMS*

News monthly newsletter, which is currently sent out in an electronic format and can be downloaded from the MIEMSS website. It is emailed to hospital, prehospital, and emergency services personnel and printed copies are sent to each fire station in the state. The newsletter keeps EMS personnel in touch with local, state, and national EMS issues. Recent topics included updates on Maryland events such as the annual EMS Stars of Life Awards and updated protocol and medical issues. MIEMSS continues to contribute information to the *Maryland Fire Dispatch*, which is an additional outlet for the dissemination of information to Maryland's emergency services community. As another way of communicating our messages, MIEMSS has developed a social media presence. MIEMSS can now be found on Facebook, Twitter, and YouTube.

In FY 2013 Educational Support Services completed the 2013 update to *The Maryland Medical Protocols for EMS Providers*, including editing, layout, and design. This document can be found on the MIEMSS website. The 2013 pocket version of *The Maryland Medical Protocols for EMS Providers* was also edited, designed, and printed by Educational Support Services and copies were distributed to EMS providers statewide. For the first time, a spiral-bound edition of the Protocols measuring 5" x 7" was also developed by this office and printed.

This year the annual Stars of Life Awards Ceremony was held in the Miller Senate Office Building in Annapolis during EMS Week in May. Both EMS for Children Right Care When It Counts Awards and Stars of Life Awards were presented, as were Governor's proclamations in recognition of EMS for Children Day and EMS Week. Press releases were distributed statewide and media coverage was obtained on the award winners.

Media events and press releases were produced during the year on many EMS-related issues. Press releases regarding high-risk dangers to infants and young children, such as hyperthermia resulting from being left alone in a vehicle, helped get the word out to the public and reduce preventable incidents. Educational Support Services' involvement in the Baltimore Area Public Safety Media Council continues to promote good working relationships between the press and public safety public information officers. Several tours of MIEMSS were conducted for local, national, and international visitors. Tour participants viewed the Maryland EMS System overview video, visited Systems Communications (SYSCOM) and the Region III Emergency Medical Resource

Center (EMRC), and listened to overviews of the statewide system presented by various MIEMSS personnel. Visitors from Italy, China, England, India, Japan, Korea, and Ireland were among the international audience that came to learn about Maryland's EMS System. Educational Support Services assists with conference planning, as well as technical and audiovisual support to MIEMSS-sponsored continuing education programs. Educational Support Services designed and produced printed materials, photographs, computer-assisted programs, and video productions that assist with the continuing education learning process. This office also provided assistance and support with in-house web conferencing, video conferencing, and teleconferencing, which were done in collaboration with other MIEMSS departments and the EMS for Children Program.

MIEMSS exhibits are designed to disseminate information about the EMS system and topics in injury and illness prevention. In FY 2013 many MIEMSS exhibits, such as those on display at the Maryland State Firemen's Association (MSFA) Convention, the annual Maryland Association of Counties Convention, and various EMS conferences and open houses were created with the assistance of Educational Support Services.

In FY 2013 MIEMSS produced an updated version of the EMS video *Meet the Protocols* to explain the changes and additions to the 2013 *Maryland Medical Protocols for EMS Providers*. In a new format this year, each provider was able to receive the updated information specifically related to his or her level of certification. The production was placed on MIEMSS' Online Training Center, which allows EMS providers to acquire continuing education through the MIEMSS website. DVD versions were also produced for company drill distribution. Educational Support Services produced the video and graphics to augment both the online and DVD training.

Several other training modules were produced by Educational Support Services during the past year. *Break it to Me Gently*, a program on Termination of Resuscitation (TOR), was completed to assist with the new TOR protocol. Working with the Maryland Fire and Rescue Institute (MFRI), topics such as *Wrong Teaching Techniques* and *Assessing the Elderly Patient* were videotaped. An update on the new National Educational Standards was produced. These modules were replicated on CDs and DVDs for distribution and also included printed materials. Video projects completed this year included the documentation of various multi-casualty disaster drills through-

out the state. Window safety messages were produced in collaboration with staff from Children's National Medical Center and Johns Hopkins Children's Center. Other productions included the Mid-Atlantic Life Safety Conference opening video and the annual MSFA Convention's Memorial Service program, video eulogies, and slide show. Educational Support Services produced a commemorative video, *A Night for Stars*, to recognize award winning cases in MIEMSS Region I. After reviewing a number of nominations, two cases were chosen and recreated through interviews with the actual providers. This video was shown during an awards ceremony held at the annual Miltenberger Emergency Services Seminar in McHenry, Maryland, in April 2013.

Statewide prevention initiatives were developed through partnerships with other state and local government agencies. Participation with the Impaired Driving Task Force, Occupant Protection Task Force, the Motorcycle Safety Task Force, the Pedestrian Safety Task Force, the Impaired Drivers Coalition, the Maryland Partnership for a Safer Maryland, the American Trauma Society, the Maryland Committee on Trauma, and the Center for Injury Prevention and Policy at the R Adams Cowley Shock Trauma Center enabled Educational Support Services to work collaboratively on multiple projects.

EMERGENCY HEALTH SERVICES DEPARTMENT

UNIVERSITY OF MARYLAND AT BALTIMORE COUNTY

Mission: To provide leadership in the field of emergency health services through excellence in education. This educational excellence is supported by an active research agenda, service to the University and EMS communities, and provision of professional continuing education. The Emergency Health Services Department recognizes the University of Maryland, Baltimore County; MIEMSS; and the Maryland, national, and international EMS communities as its constituents.

The paramedic program continues to thrive, including a large cohort of international students who come to Maryland, and the University of Maryland, Baltimore County in particular, seeking excellence in EMS education. Gary Williams, BS, NRP, has replaced Deanna Wiseman, BS, RN, NREMT-P, as Clinical Coordinator. Faculty members in the program



are exploring ways to integrate the community paramedic concept into the curriculum.

The Emergency Health Services (EHS) management program also continues to grow with more students interested in local and federal employment opportunities entering the field. Student interns continue to be placed in excellent internship sites such as MIEMSS, the Maryland Emergency Management Agency, American Red Cross, and other regional locations. Faculty members are working in coordination with the department's paramedic program to develop a management curriculum geared to delivery of community paramedic and integrated health care programs.

The EHS Graduate Program provides master's degree education in the areas of EMS system design, development and management, public health issues in EHS, education of EMS providers, and emergency management. The make-up of students is gradually changing from domestic students coming directly out of undergraduate studies toward older mid-career students, many of whom already have physician or other graduate-level degrees. There has also been an increase in international students in the program, who are moving into impressive positions throughout the United States and abroad.

Emergency Health Services' Critical Care Emergency Medical Transport Program continues to expand, now having served over 13,000 students through approximately 800 courses offered nationwide and internationally. The program has grown to 54 educational sites across the country and continues to grow with additional sites being negotiated monthly. The program rolled out on January 1, 2011, with an entirely revamped curriculum complete with pretest, quizzes, module reviews, and all new lecturer and student resources, which have been met with significantly high praise and positive feedback. The new program has been approved by the Air Surface Transport Nurses Association. We are currently

seeking Commission on Accreditation of Medical Transport Systems endorsement for the program, in addition to meeting the guidelines as an NREMT-P to NRP transition program.

Our Pediatric and Neonatal Critical Care Transport (PNCCT) program is expanding nationwide and recently received organizational endorsement by the International Association of Flight Paramedics (IAFP). This recognition brings with it the first official IAFP recognition of a course of this kind. The PNCCT program has now served more than 900 students. It is offered at 11 sites across the country and is currently being completely revamped to meet providers' needs. Experts from The Johns Hopkins Hospital, University of Maryland, and Children's National Medical Center are currently in the planning phase of reconstructing the curriculum.

The Professional and Continuing Education (PACE) program strives to promote critical-care-related education while continuing to meet the needs of the 9-1-1 provider and other affiliated healthcare professions. The program has strengthened its relationship with the University of Maryland, Department of Emergency Medicine by partnering with the residents to review course materials and serve as guest lecturers.

Additionally, the PACE program continues to expand its paramedic training with refreshers, workshops, and traditional certification-level courses. The program draws participants from places as far as Trinidad and Canada and is becoming nationally renowned with support from the IAFP and national trade publications.

EMERGENCY MEDICAL SERVICES FOR CHILDREN DEPARTMENT

Mission: To provide the leadership, direction, and expertise in the coordination of resources that focus on the unique needs of children and their families in a manner that facilitates the efficient and effective delivery of out-of-hospital, hospital, and restorative care throughout the state. These resources include injury and illness prevention, clinical protocols, standards of care and facility regulation, quality improvement and data analysis initiatives, interagency collaboration, and initial and continuing education for providers across the continuum of care that will promote the health and well-being of children, youth, and their families in Maryland.

The Emergency Medical Services for Children (EMS for Children) Department is responsible for the development of statewide guidelines, regulations, and resources for pediatric care; quality review of pediatric emergency care and implementing pediatric facility regulations and designation; coordination of pediatric education programs; and collaboration with other agencies and organizations focused on childhood health and illness and injury prevention. The EMS for Children Department coordinates the state Pediatric Emergency Medical Advisory Committee (PEMAC) and its subcommittees; the state Pediatric Quality Improvement Committee (QIC) and the Pediatric Data Analysis and Research Team; Pediatric Base Station, Trauma, and Burn programs; and the pediatric activities within the five Regional EMS Advisory Councils. Grants related to children and families in EMS are coordinated through the EMS for Children Department including a federal EMS for Children Partnership grant, continuously funded since 1994; EMS for Children-related research activities in Maryland; and the Child Passenger Safety and Occupant Protection Healthcare grant project, continuously funded since 2001. MIEMSS, and the EMS for Children Department in particular, is the lead agency for the Safe Kids Maryland state coalition, with eight local coalitions and four local chapters, and for the Maryland RISK WATCH® community with 14 local communities in partnership with the Maryland State Firemen's Association (MSFA).

EMS for Children Program Activities

The State PEMAC Committee meets on a bimonthly basis using web-based meeting technology for those unable to attend in person. The PEMAC website has been expanded to include meeting handouts, state and federal resources for EMS for Children, and relevant publications for Committee members. PEMAC has three standing subcommittees: Pediatric Protocol Development, Pediatric Education, and Prevention and Life Safety. Maryland's EMS for Children Department has created a Family Advisory Network (FAN) Council that has reviewed the "Right Care When It Counts" award nominations for past three years. In 2012 and 2013 the FAN Council played a key role in the injury prevention activities at the MSFA Convention and recruited youth from across Maryland to teach children and families (see RISK WATCH® discussion below). Working task forces meet on a regular basis as documents and procedures are updated for the Voluntary Ambulance Inspection Program (VAIP), Interfacility Transport

and Transfer, and Pediatric Emergency Department Facility Recognition (www.miemss.org/home/PEMAC/tabid/167/Default.aspx). Bimonthly forums are held in conjunction with PEMAC meetings with specific focuses: January is Transport, March is Education, May is Family-Centered Care, July is Protocol, September is Injury Control and Prevention, and November is Pediatric Research. Through the Maryland Medical Protocol review process, current state-of-the-art clinical approaches to managing childhood emergencies continue to be developed and implemented. Protocol revisions in FY 2013 were based upon a comprehensive evidence review and expert consensus process of the PEMAC.

EMS for Children Day took place on May 22, 2013. It was celebrated on May 21, 2013, at an annual awards ceremony that recognized children and youth in Maryland who had demonstrated one of the "10 Steps to Take in an Emergency" or one of the "10 Ways to Be Better Prepared for an Emergency." Five children and two teenage Marylanders received awards for their actions that ensured another person would receive "The Right Care When It Counts." Public service announcements and a Maryland EMS for Children Day poster are available in English and Spanish to promote messages of injury prevention, family preparedness, and appropriate emergency actions. More information can be found at www.miemss.org/EMSCwww/RightCare.html. Also on May 21, Debbie Gartrell-Kemp received the Maryland EMS for Children Award in recognition for her long-time commitment to promoting fire and injury prevention at her home fire company in Winfield (Carroll County) and across Maryland.

The Pediatric QIC continues to coordinate the training for the Pediatric Transport Teams and for Pediatric Base Stations. Two Pediatric Base Stations, at Children's National Medical Center and Johns Hopkins Children's Center, provide statewide coverage for online and offline pediatric medical direction. Their primary focus is on prehospital communication and education and on a dual commitment to consultation for community hospitals and adult trauma center emergency departments across Maryland. Through ongoing quality improvement activities, recommendations are made that directly impact protocol development, revision, and advancement, as well as targeted pediatric education at conferences and seminars. In collaboration with the two Pediatric Burn Centers (Johns Hopkins Children's Center and Children's National Medical Center) and the Adult Burn Center (Johns Hopkins Bayview Medical Center), the State

has established a unique centralized burn data registry with new reports to assist local communities with their prevention activities. The Maryland Burn Outpatient Registry will capture both emergency department treat and release cases, along with initial and follow-up burn clinic visits, allowing Maryland to accurately describe the impact of burn injuries on its citizens.

EMS for Children Grant Activities

Federal EMS for Children grants are coordinated through the Maryland EMS for Children Department and involve statewide projects, specialized targeted issues, projects, and research initiatives at academic universities. MIEMSS is in the eighth year of an EMS for Children State Partnership Grant from the Maternal Child Health Bureau (MCHB)/Heath Resources Services Administration of the US Department of Health and Human Services. The 2009-2013 EMS for Children Partnership Grant focuses on the continued integration of EMS for Children into the Statewide EMS System utilizing both the federal Maternal Child Health Core Performance Measures and the federal EMS for Children Performance Measures as targeted projects. The specific grant goals include:

1. Continue to implement system enhancements with EMS for Children initiatives that will move toward achieving targets for the federal EMS for Children performance measure standards 71-80 and support MCHB performance measure standards related to children and family health.
2. Expand the Maryland EMS for Children FAN Council's activities through renewed invitation to rural EMS regions and hospitals for new members of the Council, including youth and young adult members. Expand prevention and disaster preparedness programs identified by the FAN Council.
3. Establish a collaborative for pediatric EMS and emergency department quality improvement and data analysis through development of standard pediatric EMS reports to promote local and regional quality improvement activities and to monitor compliance with statewide EMS protocols.

During FY 2013 the Maryland EMS for Children team focused on specific Performance Measures where development and implementation is still needed. This department continues to work with both public safety and commercial providers for the adoption

of all patient assessment and treatment equipment for Ambulance Transport Vehicles that are recommended by the national EMS for Children Program and professional organizations. The Maryland EMS for Children Department continued to provide leadership in the coordination of the Atlantic EMS for Children Region, which includes representatives from South Carolina, North Carolina, Virginia, West Virginia, Maryland, Delaware, Pennsylvania, New Jersey, New York, and Washington, DC. These EMS for Children coordinators meet in May and December to share resources as all states work on the federal EMS for Children Performance Measures and continue to promote pediatric educational programs within state and local conferences. The December 2012 meeting focused on interfacility and interstate transport resources and guidelines.

The federal EMS for Children research agenda continues to be implemented through the national Pediatric Emergency Care Applied Research Network (PECARN). The Network has established data linkage projects and the structure to apply for and implement pediatric EMS and emergency department research initiatives. MIEMSS continues to work with the local research network node of PECARN located at Children's National Medical Center on prehospital research capacity building, including participating in annual advisory committee meetings and focus groups on Asthma Scoring tool development.

Pediatric EMS and Hospital Education

During each of the EMS and Emergency Nursing educational seminars and conferences in Maryland in FY 2013, pediatric displays and/or pediatric topics were presented to highlight both protocol changes and findings from ongoing EMS for Children PECARN studies. Pediatric topics are listed in the annual continuing education chart (see page 13).

In the past year, the EMS for Children Department has sponsored several S.T.A.B.L.E. courses across the State. S.T.A.B.L.E. stands for the six assessment and care modules in the program: Sugar, Temperature, Airway, Blood pressure, Lab work, and Emotional support. The S.T.A.B.L.E. program is a neonatal education course focusing exclusively on the post-resuscitation/pre-transport stabilization care of sick infants. It is designed for both prehospital and hospital providers who do not routinely work in the NICU setting. To accomplish this, the EMS for Children Department partnered with faculty from the Maryland Regional Neonatal Transport Program, Children's National Medical Center, Shady Grove Adventist Hospital, and Peninsula Regional Medical Center.

Pediatric Emergency Care Education across Maryland

Month and Location	Conference Title	Pediatric Components
October 2012 Clinton, MD	Pyramid 2012	Preconference: The S.T.A.B.L.E. Program Workshops: When Children Fall Off the Trauma Decision Tree, Pediatric Puzzlers Displays: Safe Transport of Children in Ambulances, CPS and OP Healthcare Project
October 2012 Cheverly, MD	Emergency Nurses Association (ENA) Barbara Proctor Conference	Displays: CPS and OP Healthcare Project, EMS for Children Guidelines for Care of Children in Emergency Departments
November 2012 Ocean City, MD	Peninsula Regional Medical Center Trauma Conference	Display: Safe Transport of Children in Ambulances
January 2013 Tilghman Island, MD	Winterfest Conference 2013	Preconference: When the Stork Dials 911 Workshops: When Children Fall Off the Trauma Decision Tree, Pediatric Puzzlers Displays: Safe Transport of Children in Ambulances, CPS and OP Healthcare Project
March 2013 College Park, MD	Public Fire and Life Safety Educator Seminar	Workshops: Fun Facts about Fire & Life Safety
March 2013 McHenry, MD	Miltenberger Emergency Services Seminar 2013	Preconference: The S.T.A.B.L.E. Program Workshops: Water and Kids Don't Always Mix Well, Family Presence: Debunking the Myth, Pediatric Assessment: Assessing Tots to Teens Displays: Safe Transport of Children in Ambulances, CPS and OP Healthcare Project
May 2013 Ocean City, MD	EMS Care 2013	Preconferences: The S.T.A.B.L.E. Program, When the Stork Dials 911 Workshops: Oh Baby! Difficult Labor Presentations, When Children Fall Off the Trauma Decision Tree, Generation XXL: Dealing with Childhood Obesity, SCORE: Concussion Evaluation and Management for EMS, Critical Pathways in Asthma Displays: Safe Transport of Children in Ambulances, CPS and OP Healthcare Project
May 2013 Linthicum, MD	ENA by the Bay 2013	Workshops: Maryland's Results from the National Pediatric Readiness Project: How Ready Are Emergency Departments to Care for Our Children?, Kids Can't Fly—Children and Windows Don't Mix Display: CPS and OP Healthcare Project
June 2013 Ocean City, MD	Maryland State Firemen's Convention	Workshops: Pediatric Puzzlers, Families Need to Be Prepared Child and Family Interactive Displays: RISK WATCH® and Safe Kids: Steps to Safety—Focus on Sports Safety, Make the Right Call: 9-1-1 Access, Home Fire Safety, Poison Safety, Burn Safety and Disaster Preparedness

The EMS for Children Department also released an online training program entitled *Carbon Monoxide Hazards & Response*. In this course, Major Dennis Wood, MS, NREMT-P, from the Prince George's County Fire/EMS Department discusses the hazards and prevalence of carbon monoxide (CO) poisoning, the process to respond to a CO incident, and how to appropriately treat patients.

In an effort to meet the continuing education needs of EMS providers, the EMS for Children Department worked collaboratively with faculty from

across the state to develop *When the Stork Dials 911*. This 8-hour workshop reviews the steps for delivery and newborn stabilization, discusses interview and assessment techniques for the mother and newborn, and identifies keys to appropriate triage, treatment, and transport decisions. Over the course of the past year, this workshop has been delivered twice with rave reviews. The EMS for Children Department intends on publishing the didactic content of this course to MIEMSS' Online Training Center in FY 2014.

Child Passenger Safety and Occupant Protection Healthcare Project

Now in its twelfth year, the Child Passenger Safety and Occupant Protection (CPS and OP) grant from the Maryland Department of Transportation Highway Safety Office continues to support statewide CPS efforts by focusing on educating healthcare staff. Within EMS for Children, federal highway safety funds are used to bring expert occupant protection training and resources to Maryland hospitals, healthcare providers, and the EMS and fire community.

Child passenger safety patient materials and provider resources are routinely provided to hospitals and pediatric offices. In-hospital, unit-wide trainings occurred this year at Mercy Medical Center and MedStar Union Memorial Hospital of Cecil County for newborn and NICU staff. Additionally, training updates on CPS were given at Howard County General Hospital, Peninsula Regional Medical Center, Sinai Hospital, Meritus Medical Center, and Garrett Memorial Hospital. Car seats and dolls were given to a few hospitals to encourage staff to demonstrate to parents the proper use of car seats and to have them practice while at the hospital. New this year, short educational videos about CPS are now available on the MIEMSS website and distributed to Maryland hospitals for use on their closed-circuit TV systems.

To help teach best practice in CPS, a conference call with accompanying slideshow presentation was held in March: *Safer Transport for Children in Ambulances*. The presentation featured EMS for Children Project Director Cyndy Wright-Johnson and Education Specialist Danielle Dunn speaking on the recently-released National Highway Traffic Safety Administration (NHTSA) guidelines for restraining children in emergency ground ambulances. This webinar reached more than 70 car seat safety specialists, healthcare providers, health department staff, police officers, and fire/rescue personnel. All webinars are archived on the MIEMSS website to be viewed at any time (www.miemss.org/EMSCwww/CPSConference.html).

The National Child Passenger Safety Week (September 16-22, 2012) and the updated Maryland CPS Law (effective October 1, 2012) were celebrated jointly with a press event covered by three Baltimore TV stations, which then ran the spots repeatedly for several days. That coverage, plus two paid ads in local parenting circulars, meant that thousands of Marylanders heard about the state's improved safety seat law. Collaborations among MIEMSS and Maryland Kids in Safe Seats (KISS)/Department of

Health and Mental Hygiene, Baltimore Safe Kids, and the University of Maryland Medical Center made this event successful.

The CPS and OP Healthcare Project continues to assist the University of Maryland Rehabilitation & Orthopaedic Institute (formerly Kernan Hospital) develop a child passenger safety service for children with special transportation needs (e.g., casts and leg or arm braces) so they can ride home safely in adapted conventional car seats or special seats.

This year, 13 nurses and other safety advocates were trained to teach the youth occupant safety program. This program uses games and hands-on activities to teach youth ages 10 to 15 how to be safe passengers in cars. Topics include seat belt use, airbag safety, and how to avoid distracting drivers. Some of the materials for this program were adapted from Safe Kids Worldwide. The program was pilot-tested with seven community groups this year and the results are being used to fine-tune the program. Additionally, this pilot project was presented as a poster at the Lifesavers Traffic Safety Conference in Denver, Colorado, in April 2013.

EMS for Children's team continues to educate emergency providers on properly buckling up their patients and themselves. Interactive exhibits on CPS were held at each regional EMS conference, the EMS Cares Conference, and at several Emergency Nurses Association conferences. "Buckle Up – Day & Night" banners continue to be promoted during national Click It or Ticket (CIOT) campaigns in May and November and also at other opportune times, such as after a much-publicized local crash. EMS vehicle safety is also emphasized with both interactive displays (SECURE¹) and a statewide campaign to "Buckle Up – Every Ride Every Time" that promotes education for providers and the public. All of these educational programs provide best practices for securing children, their families, EMS and hospital providers, and equipment within EMS transport vehicles.

Injury Prevention and Life Safety

The Maryland Ambulance Safety Taskforce continues to meet on a quarterly basis, led by MIEMSS Executive Director Dr. Robert Bass and supported by the EMS for Children Department and State Office of Commercial Ambulance Licensing and Regulation in partnership with the MSFA. Analysis of EMS, fire, and rescue crash data is being updated by The Charles "McC" Mathias, Jr., National Study Center for Trauma and Emergency Medical Systems in prepara-

¹SECURE messaging: **S**tretcher with three safety straps and two over-shoulder harnesses; **E**quipment is secured with straps in working order; **C**abinets are closed and latched/locked; **U**se age and size appropriate restraints for patients; **O**xygen is **R**estrained in crash-stable brackets; **E**veryone is secured in a restraint—patient, providers, and family

tion for a fall Ambulance Safety Summit. MIEMSS continues to distribute vinyl banners to EMS and fire/rescue stations across Maryland to provide a visual reminder to the public and to providers to “Buckle Up – Day & Night.”

The EMS for Children staff participates in national, state, and local Safe Kids coalitions, the Maryland division of the American Trauma Society (ATS), the Maryland Occupant Task Force, and the Child Passenger Safety Board coordinated by the State Highway Administration (SHA). This collaboration provides a consistent flow of information to the five regional pediatric committees and the state PEMAC on injury prevention resources and initiatives. EMS for Children continues to liaison with the Child Fatality Review Committee in collaboration with the Maternal Child Health Department and the Partnership for a Safer Maryland led by the DHMH and funded by a Centers for Disease Control and Prevention (CDC) grant. In September 2012 PEMAC and the Partnership jointly held a prevention forum focused on Public Policy Primer—Advocating for Prevention Legislation. Faculty included the University of Maryland Law School, Children’s National Medical Center, and the Maryland State Firemen’s Association and Ladies Auxiliary.

The Maryland RISK WATCH[®] Community is led by the MIEMSS EMS for Children Department in collaboration with the Office of the State Fire Marshal and the MSFA Fire Prevention and Life Safety Committee, along with the Maryland and local Safe Kids coalitions. Other partners in RISK WATCH[®] include the SHA, the Maryland State Police, the Maryland and National Capital Poison Centers, the Maryland Chapter of the ATS, and the Maryland Department of Natural Resources. During the fifteen years of the RISK WATCH[®] program in Maryland, communities have placed it into classrooms, before- and after-school programs, summer camps, child and parent educational programs in hospitals, and injury prevention programs. There are 14 communities working with RISK WATCH[®] materials and planning for school, after-school, day-care, and department programs:

- Calvert County is incorporating RISK WATCH[®] with St. Leonard Voluntary Fire Department’s community activities.
- Carroll County has RISK WATCH[®] Injury Prevention programs at two elementary schools.

- Cecil County Emergency Services has RISK WATCH[®] resources, with their Emergency Operations Center leading the program, and is increasing Safe Kids Buckle Up activities through their chapter. Cecil County took the lead on the “Make the Right Call” training, lead by Captain Holly Trego, at the MSFA Convention. For the 2013 MSFA Convention, a new DVD was made in Cecil County to demonstrate for children exactly what a Public Safety Dispatcher does during a 9-1-1 call.
- Frederick County has RISK WATCH[®] resources for after-school programs in both private and public programs.
- Garrett County is using the RISK WATCH[®] resources through the Safe Kids chapter based at its Health Department.
- Howard County’s Parks and Recreation has RISK WATCH[®] materials for education in before- and after-school programs.
- Johns Hopkins Children’s Center Pediatric Emergency Department and Child Life Department use RISK WATCH[®] with families for safety education.
- Kent Island Volunteer Fire Department is introducing the RISK WATCH[®] resources to elementary schools on Kent Island and using them in ongoing safety educational programs in the community.
- Montgomery County Fire and Rescue is involved in public, private, and home schools, library programs, RISK WATCH[®] Recess, child care centers, and programs in hospitals. Each library and fire station has the curriculum.
- Prince George’s Special Education Centers have four schools located in special centers and are mentoring new programs in other counties as they develop RISK WATCH[®] tools for children with different abilities.
- Prince George’s County Fire Association is using RISK WATCH[®] in their work with Family Day Care Centers in Forestville.
- Prince George’s County Fire and EMS Department focused on disaster preparedness during the past school year and continues to expand its RISK WATCH[®] program with over 70 day-care programs.
- Rock Hall Volunteer Fire Company is using RISK WATCH[®] activities at community prevention programs.

- Tilghman Island’s after-school program has RISK WATCH® resources for use in both fire and life safety and disaster preparedness materials, which have been donated to its school and public library.

At the 2013 MSFA Convention, fire and injury prevention interactive stations designed for the entire family provided information to different audiences. This program has four objectives:

1. To provide young children and school-age children hands-on educational experiences to be safer in their homes and communities through both psychomotor skills and learned knowledge about high risk injuries
2. To provide young life-safety advocates (twens, teens, and young adults) with a mentored experience and provide specific lesson plans to work with younger children and their families
3. To empower parents and care providers with knowledge on both risks and prevention strategies to keep everyone safer in their home and community (infants through seniors)
4. To demonstrate interactive safety displays based upon evidence-based/best practices for life-safety advocates across Maryland’s EMS and fire and rescue services

Again this year the RISK WATCH® team served as many adults seeking new information, tools, and resources on teaching fire and injury prevention to children as they did families and young children. The response from the youth and young adults increased significantly this year, providing the mentors with the ability to rotate these volunteers through a number of different risk areas and to provide coaching. Cecil County Department of Emergency Services, Johns Hopkins Children’s Center Pediatric Emergency Department, MIEMSS EMS for Children Department, Peninsula Regional Medical Center Trauma Program, Silver Spring Volunteer Fire Department Life Safety Unit, and the American Trauma Society all participated in the MSFA convention. Interactive displays included the following:

- In an Emergency – Dial 9-1-1, Don’t Play Around (9-1-1 magnets were available to each family)
- Is it Hot? Or Not? Play it Safe – Burn awareness game for younger children and written materials for families
- Is It Safe? Or Not? Play it Safe – Poison awareness game for younger children and new 40th anniversary Maryland Poison Center material for families

- Get Out and Stay Out – Fire safety table top house and “map” for younger children and exit drills in the home (EDITH) plan for families
- Champions Prepare and Play Safe – Safe Kids and CDC sports safety display with family checklist and concussion assessment tools along with correct fitting of a helmet
- Are you Prepared – Disaster preparedness for children and families; each child received a backpack to prepare.
- Never Leave Your Child Alone in a Car–Heat stroke prevention

The EMS for Children Department at MIEMSS is the lead organization of the Safe Kids Maryland Coalition and holds quarterly meetings. The state coalition website (www.safekidsmd.org) has been expanded to include a variety of online resources. Coalition meetings have added the capabilities for conference call-in and a GoToMeeting® web-based platform to enable more participation. Again in FY 2013 the Maryland and National Safe Kids programs dedicated their websites and various press releases to a very important and high risk danger to infants and young children: hyperthermia secondary to being left alone in a vehicle. Again this year the campaign slogan was: “Never Leave Your Child Alone” and the NHTSA campaign was “Where is Baby – Look Before You Lock.” The overall goal of the ongoing campaigns is to make family members and child care providers aware of the deadly risks to children when they are left unattended in a vehicle. More information is available on the state coalition website. An educational webcast was held in June 2011 and is now available for viewing on the MIEMSS CPS and OP website at <http://miemss.org/EMSCwww/CPSCConference.html>.

EMRC/SYSCOM

Mission: The Maryland EMS Communications Center is a statewide coordination and operation center for Maryland’s EMS system, which functions 24 hours, 365 days a year. The Communications Center has two integrated components: Systems Communications (SYSCOM) and Emergency Medical Resource Center (EMRC).

SYSCOM, a partnership between and jointly staffed by MIEMSS and the Maryland State Police (MSP), receives requests for, dispatches the most appropriate, and coordinates helicopter resources for missions including medevac, search and rescue, law enforcement, homeland security, and disaster assessment.

EMRC is staffed by MIEMSS and has a three-fold mission:

- 1. Providing communications linkages and facilitating medical consultations between prehospital EMS providers and emergency departments, trauma centers, and specialty centers*
- 2. Maintaining and sharing situational awareness of the activities, capabilities, and capacities of the prehospital system and hospitals*
- 3. Providing initial alerting and coordination of resources and the distribution of patients during major medical incidents*

In FY 2013 the Emergency Medical Resource Center (EMRC) handled 214,116 telephone calls and 158,860 radio calls. Of these 372,976 calls, 138,139 were communications involving a patient or incidents with multiple patients, while 13,064 of these calls involved on-line medical direction.

In FY 2013 the Systems Communications (SYSCOM) center handled 26,035 telephone calls and 1,844 radio calls. Of these 27,879 calls, the majority were related to requests for medevac helicopters.

EMRC/SYSCOM continued to participate in the National Disaster Medical System. Utilizing the Facility Resource Emergency Database (FRED), EMRC/SYSCOM obtained hospital bed status information for several events and routine quarterly exercises.

The FRED system was also utilized by EMRC/SYSCOM in support of local emergencies and exercises conducted statewide.

As part of a cooperative agreement, EMRC/SYSCOM answered over 530 calls for the Maryland Department of Health and Mental Hygiene 24-hour Duty Officer.

GOVERNMENT AFFAIRS

Each year, MIEMSS Office of Government Affairs works to assist the Executive and Legislative branches of State government in developing effective statutory approaches and solutions to a variety of emergency care needs. MIEMSS works on proposed legislation that affects all the various components of the Statewide EMS System, the emergency care system, as well as Maryland's healthcare system in general. In this effort MIEMSS partners with EMS providers, physicians, nurses, hospitals, and other healthcare providers to ensure that EMS system issues are accounted for in legislation considered by the Maryland General Assembly.

EMS-related legislation during the 2013 Legislative Session included the following bills that were passed by the General Assembly:

- The Maryland EMS Operations Fund (MEMSOF) will have increased revenues from a \$3.50 annual increase to the vehicle registration fee surcharge. MEMSOF provides funding to MIEMSS, the Maryland State Police Aviation Command, the Maryland Fire and Rescue Institute, the R Adams Cowley Shock Trauma Center, and the Amoss Fund, which provides grants to local jurisdictions to purchase fire and rescue equipment and capital building improvements.
- The Veterans Full Employment Act of 2013, effective July 1, 2013, expedites licensing for US Armed Forces service members seeking Maryland licensure or certification. Training and education provided by the military and completed by a service member will be credited toward training/education requirements for licensure or certification if it is determined by the EMS Board to be substantially equivalent to training/education required by the Board and to not be otherwise contrary to any other licensing requirement.
- Counties and municipalities that own or operate swimming pools must develop and implement an automated external defibrillator (AED) Program to ensure that an AED is on-site and trained individuals are present.
- Counties will be required to distribute a minimum percentage of funds received from the Amoss Fund to volunteer fire, rescue, and ambulance companies.
- Local school boards must evaluate and report on their emergency management plan for each public school.
- The Maryland Telemedicine Task Force will continue its work to identify opportunities to use telehealth to improve health status and health delivery and identify strategies for telehealth deployment in rural areas. The Maryland Medical Assistance Program will cover medically necessary services delivered by telemedicine for the treatment of cardiovascular disease or stroke in an emergency department, when an appropriate specialist is available.
- A surcharge for 9-1-1 services on wireless telecommunication services will now also apply to prepaid wireless services; the surcharge benefits the 9-1-1 Trust Fund.

HEALTH CARE FACILITIES AND SPECIAL PROGRAMS

Office of Hospital Programs

Mission: To implement the designation and verification processes for trauma and specialty referral centers, provide continuing evaluation of these centers for compliance with the regulations and standards in COMAR 30.08 et seq., and ensure ongoing quality monitoring of the trauma/specialty care system.

Primary and Comprehensive Stroke Centers

The designation of Primary and Comprehensive Stroke Centers throughout Maryland was a direct result of a call to action from the Maryland Heart Disease and Stroke Council to address systems changes in stroke prevention and coordination of the delivery of care to the acute stroke patient. The Office of Hospital Programs' responsibility is to carry out the designation and re-verification of Primary and Comprehensive Stroke Centers as specialty referral centers statewide.

Since 2007 MIEMSS has designated 35 Maryland Hospitals as Primary Stroke Centers. (See page 39 for a complete list of Primary Stroke Centers.) MIEMSS has initiated the second five-year cycle for the re-verification of Primary Stroke Centers. During FY 2013 four Primary Stroke Centers applied for and received re-verification.

In FY 2013 MIEMSS designated the first Comprehensive Stroke Center in Maryland. (See page 39 for a complete list of the Comprehensive Stroke Centers.) A Comprehensive Stroke Center is defined as a "facility or system with the necessary personnel, infrastructure, expertise, and programs to diagnose and treat stroke patients who require a high intensity of medical and surgical care, specialized test, or interventional therapies." The standards, which were promulgated by the EMS Board in 2011, are based on the recommendations of the Brain Attack Coalition as published in the *Journal of the American Medical Association* (JAMA), as are standards for Primary Stroke Center designation. The regulations include structural and functional requirements for a hospital seeking designation as a Comprehensive Stroke Center. All Primary and Comprehensive Stroke Centers submit data monthly to the American Heart Association Get With The Guidelines[®]-Stroke Registry. MIEMSS accesses the registry monthly and monitors both Primary and Comprehensive Stroke Centers for compliance with the core performance measures established by the American Heart Association and American Stroke Association.

Compliance with the core performance measures has been shown to improve patient outcomes.

This office supports the meetings of the Stroke Quality Improvement Committee (QIC), an advisory body to MIEMSS for quality improvement issues affecting the care of patients with acute stroke and for the designation of specialty centers to provide stroke care. The advisory body is comprised of one designated representative from each Stroke Center. MIEMSS worked closely with members of the Stroke QIC and various stakeholders, including emergency department physicians, neurologists and hospitals on the development and implementation of the Inter-Hospital Transfer Guidelines for Stroke. These guidelines will maximize quality of care, ensure patient safety, and promote effective use of health care resources. The goal is to have the right patient, at the right center, at the right time.

EMS Base Stations

Hospital Programs staff continued to collaborate with the Medical Director's Office on EMS Base Station verification in FY 2013. Management activities included issuing certifications to emergency department personnel completing the Base Station Communications course as well as monitoring and certifying new Base Station instructors. In FY 2013 five hospitals applied for re-designation as MIEMSS-approved Base Stations. Each of the hospitals completed a self-assessment survey as well as an application. MIEMSS reviewed both the assessment and application and then conducted a Base Station site visit. The survey team was composed of MIEMSS staff, a MIEMSS Regional Medical Director, and a MIEMSS Regional Administrator. All five hospitals received re-designation as MIEMSS-approved Base Stations.

Trauma System

Maryland's Trauma System is a working model of experience and expertise that has helped set the standard in trauma care for the nation. The Maryland Trauma System is a regionalized, tiered-approached system organized and coordinated under MIEMSS. This approach ensures that injured patients are promptly taken to the most appropriate hospital trauma center and has been shown to enhance patient outcomes and decrease patient morbidity and mortality.

The designation of Trauma Specialty Referral Centers—Pediatric, Burn, Neurotrauma, Eye, and Hand—provides Maryland with an inclusive Comprehensive Trauma System. To facilitate expedited trauma care to Maryland patients in outlying areas

and patients requiring higher level care, Memoranda of Understanding (MOUs) are in place with out-of-state hospitals: The Children’s National Medical Center in Washington, DC, for pediatric trauma and burns and Christiana Care Health Services in Newark, Delaware, for adult trauma patients. Trauma centers are re-verified every five years to assure that each continues to meet regulations and performance standards for trauma care. During FY 2013 nine Trauma Centers and one Specialty Trauma Center submitted applications for re-designation. The re-designation process will continue throughout FY 2014.

The Trauma Quality Improvement Committee (TQIC), supported by MIEMSS’ Office of Hospital Programs, is comprised of representation from each designated trauma center. This committee meets regularly to identify and recommend opportunities for trauma system improvement to MIEMSS. In FY 2013 the TQIC focused on ground-level falls in the elderly utilizing Maryland Trauma Registry (MTR) data. The Trauma Centers used this data to support changes to their Trauma Activation Protocols, following the EMS Trauma Decision Tree, to best care for incoming patients. Trauma Centers are able to focus their training and continue education and injury prevention initiatives with “lessons-learned” on ground-level falls suffered by Maryland’s elderly population. This committee was also instrumental in revising and updating the Registry Adult and Pediatric Data Dictionaries and moving the current MTR to a web-based platform, which interfaces with Maryland’s prehospital electronic patient care information system (eMEDS®). This interface will enhance data consistency and data capture and provide the opportunity for improved reporting on patient outcomes. The web MTR upgrade will keep the Registry current and compliant with the National Trauma Data Bank® (NTDB) and will facilitate submission of trauma data by individual Maryland Trauma Centers.

Perinatal Referral Centers

MIEMSS works closely with the Maryland Department of Health and Mental Hygiene (DHMH) regarding the designation of perinatal centers in Maryland. The DHMH provides grant funds to support a full-time position at MIEMSS to coordinate the perinatal programs in the Office of Hospital Programs.

MIEMSS has initiated the second five-year cycle for the re-designation of Level III Perinatal Referral Centers. During FY 2013 sixteen Level III Perinatal Referral Centers submitted applications for re-designation, which will continue throughout FY 2014. (See page 39 for a complete list of perinatal centers.)

Hospitals participating in the Maryland Perinatal System submit patient care data to the DHMH and MIEMSS, as appropriate, for system and quality management. All Level III Perinatal Referral Centers submit an annual perinatal indicator report that provides statistics beyond mortality data and focuses on striving for clinical excellence, patient safety, and reliability with zero preventable adverse outcomes. Defined maternal and neonatal indicators include:

Maternal Indicators:

1. Total number of live births
2. Number of transport admissions:
 - a. to a higher level of care
 - b. from a non-obstetrics-providing facility
3. Number of transports out
4. Number of maternal deaths
5. Number of uterine ruptures
6. Number of cesarean hysterectomies and postpartum hysterectomies
7. Number of eclampsia/seizures
8. Number of maternal admissions to Intensive Care Unit
9. Number of inpatients returned for a complication to OR/L&D following delivery
10. Number requiring blood transfusions
11. Number of 3rd/4th degree episiotomies
12. Number of neonatal birth traumas
13. Number of fetal deaths:
 - a. of 20 weeks or greater
 - b. of 37 completed weeks of gestation or greater
14. Number of intrapartum deaths > 500 g
15. Number of neonatal deaths in the delivery room
16. Number of primary C/S deliveries
17. Number of repeat C/S deliveries
18. Number of VBAC deliveries
19. Number of total deliveries
20. Number of maternal re-admission patients returned to OR (same facility)
21. Number of maternal re-admissions (to the same facility)
22. Number with HIV diagnosed and/or treated intrapartum as well as prenatally
23. Number that have not received any prenatal care

Neonatal Indicators:

1. Number and percentage of admissions transferred back to birth, or local, hospital
2. Number and percentage of admissions transferred to another NICU for higher level or specialty care

3. Number and percentage of nosocomial infections (blood stream infections only)
4. Number and percentage of pneumothoraces
5. Number and percentage of severe intraventricular hemorrhage
6. Admission temperature to NICU
7. Charts with adequate documentation of immunization status

MIEMSS continues to work closely with DHMH in supporting all perinatal centers that have the ability to participate in the Vermont Oxford Network Reporting System. This system provides each perinatal center the ability to benchmark their center's data to data from all group centers.

Office of Cardiac and Special Programs

Mission: To develop and implement policies, regulations, and programs for the enhancement and improvement of the Statewide EMS System and the community.

Hospital Alert Utilization/Emergency Department Overcrowding

MIEMSS monitors statewide alert activity via the County Hospital Alert Tracking System (CHATS) and generates quarterly reports comparing current utilization volumes with the past year's utilization volumes. Real-time CHATS screens showing hospital alert activity in all regions and online reports containing individual hospital alert activity are available on the MIEMSS website at www.miemss.org. Additionally, MIEMSS is able to monitor EMS "release of patient care" and "return-to-service" times recorded in the EMS patient care record. The "release of patient care" time is the amount of time from EMS arrival at the emergency department until the patient is moved to a hospital stretcher. The "return-to-service" time is the length of time a provider is at an emergency department with a patient before returning to service. These times are helpful indicators of the impact of emergency department crowding on the EMS system.

CHATS includes several categories of alerts that indicate whether a hospital emergency department is temporarily unable to accept certain ambulance-transported patients. Yellow Alert, indicating emergency department overload, is the most frequently-utilized alert category and has the most significant impact on EMS providers transporting patients. After peaking in 2006, Yellow Alerts then declined over the next several years. In FY 2011 and again in FY 2012, however, a slight increase in Yellow Alerts occurred. MIEMSS is working with individual hospitals to

determine the cause for the increased utilization and develop a plan to decrease Yellow Alerts.

MIEMSS provides weekly Yellow Alert utilization reports to DHMH throughout the year. Additionally, during the flu season, MIEMSS monitors alert activity on a daily basis and provides reports to EMS regions as necessary to assist them in deciding whether to implement strategies from the Maryland Hospital and EMS Emergency Department Overload Mitigation Plan. No strategies from the Plan were required to be implemented during the 2012-2013 flu season, which was reported by DHMH to be more severe than in the last several years.

Public Access Automated External Defibrillator Program

The Maryland Public Access Automated External Defibrillator (AED) Program continues to grow throughout the state. With the exception of public high schools, which are required to have AEDs, Maryland's Public Access Defibrillation (PAD) Program is currently 100% voluntary. The program permits non-healthcare facilities that meet certain requirements to have an AED onsite to be used in the event of a sudden cardiac arrest until EMS arrives. During the 2013 Legislative Session, the Maryland General Assembly passed a bill that will require all public pools to have AEDs; the law goes into effect October 1, 2013. Additionally, some counties have passed local ordinances requiring AEDs at public and semi-public pools. Montgomery County also requires AEDs at health clubs. In FY 2013 MIEMSS processed 544 new PAD Program applications and 256 renewal applications for a total of 800 PAD Program approvals; this was a 59% increase from FY 2012. Currently, there are 4,165 actively registered PAD locations with AEDs onsite, with thousands of individuals trained in cardiopulmonary resuscitation (CPR) and AED use. A list of PAD-participating facilities and program information can be viewed in the public information section of the MIEMSS website.

The PAD Program has had 125 (24%) successful AED uses out of 514 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, 304 were witnessed. Of those witnessed arrests, 93 patients regained a pulse at the time of EMS arrival for a nearly 31% save rate for witnessed cardiac arrests.

At the 2013 Stars of Life Awards Ceremony, MIEMSS was proud to present a Director's Award for Excellence in EMS to four members of the Ocean

City Beach Patrol for their efforts resulting in the successful resuscitation of a competitive surfer. The Ocean City Beach Patrol keeps AEDs on their all-terrain vehicles. They were able to quickly respond and shock the victim, who regained a pulse but required rescue breathing until EMS arrived. The rapid response by the Beach Patrol undoubtedly helped this victim survive.

Cardiac Arrest Steering Committee

In October 2012 MIEMSS reorganized the former AED Task Force into the Cardiac Arrest Steering Committee and broadened the focus to address multiple components including 9-1-1 dispatch, prehospital provider treatment, community response, and data collection and reporting. While some of the membership from the AED Task Force is the same, there are many new members. The Committee is chaired by Dr. Kevin Seaman, the EMS Medical Director for Howard County, who has been working diligently to model efforts that have been successful in Seattle, Washington, through the National Resuscitation Academy. Dr. Seaman has also worked with MIEMSS to establish the Maryland Resuscitation Academy. Using a multi-focused approach to address out-of-hospital cardiac arrest, the committee has established three subcommittees: Emergency Medical Dispatch (EMD), EMS, and Public. The EMD subcommittee is focusing on providing early dispatch of EMS to cardiac arrest calls and providing dispatch-assisted CPR instructions to the caller until EMS arrives. The EMS subcommittee is promoting high-performance CPR to all EMS Operational Programs

in Maryland. The Public subcommittee is educating the public about cardiac arrest and encouraging the public to learn CPR and how to use an AED. Communities that have incorporated all of these elements into responding to sudden cardiac arrest have improved rates of survival from sudden cardiac arrest.

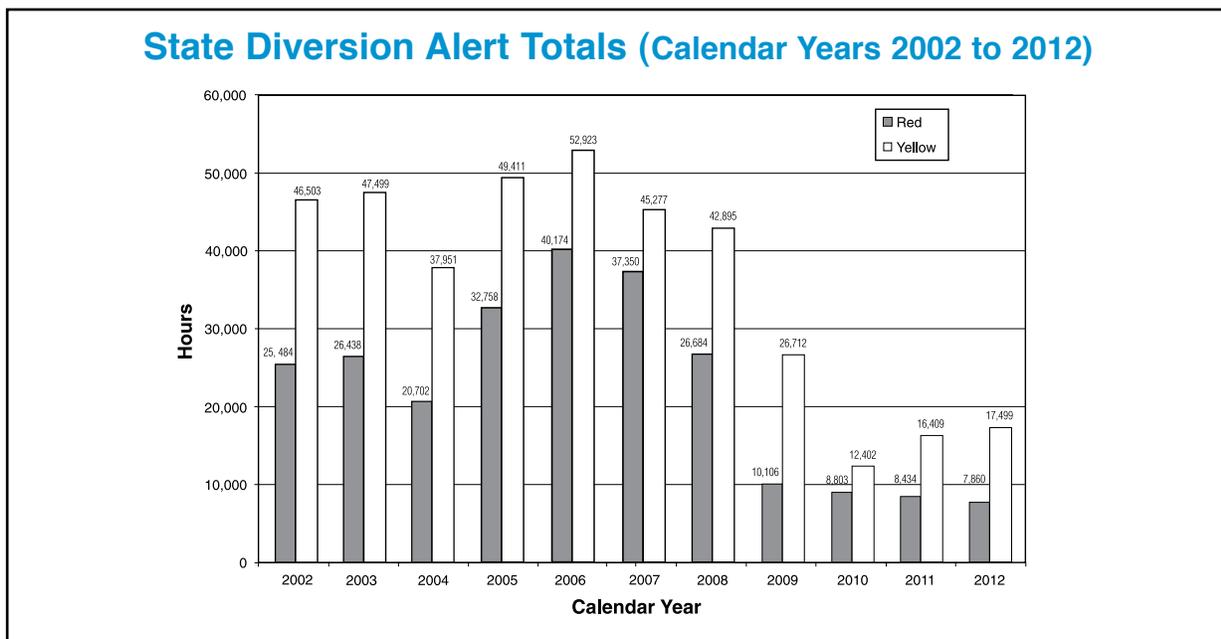
Maryland STEMI System

After more than two years since the designation of Maryland’s 23 Cardiac Interventional Centers and 4 out-of-state centers, the Statewide System continues to evolve. (See page 39 for a complete list of Cardiac Interventional Centers.)

Designation as a Cardiac Interventional Center indicates that a hospital complies with State standards to receive patients transported by EMS who are experiencing the most common type of heart attack called an “ST-elevation myocardial infarction,” or STEMI. For these patients, primary percutaneous coronary intervention (pPCI) (also known as “balloon angioplasty”) is recognized by the American College of Cardiology and the American Heart Association as the treatment of choice and is generally associated with fewer complications and better outcomes than other forms of treatment.

It has also been well established that the sooner a patient is treated to relieve the blockage causing the STEMI, the better the heart muscle will recover. Reducing the time from the onset of symptoms to treatment requires that there be a high degree of coordination and integration of care between EMS providers in the field and medical staff in the hospital.

EMS providers who have identified a STEMI



patient may now transport that patient to the closest designated Cardiac Interventional Center, bypassing non-designated hospitals in accordance with *The Maryland Medical Protocols for EMS Providers*. In instances, however, when a Cardiac Interventional Center is not within an additional 30-minute drive time, patients may be transported to the closest emergency department for rapid assessment, treatment, and then transferred to a Cardiac Interventional Center.

All Cardiac Interventional Centers submit data on a quarterly basis to the American College of Cardiology Foundation's National Cardiovascular Data Registry ACTION Registry[®]-GWTG[™]. MIEMSS is able to obtain the Mission Lifeline System Reports that are created from the data entered into the ACTION Registry[®]-GWTG[™] to measure care for STEMI patients in Maryland as compared to national data.

Regional STEMI Committees were formed and continue to meet regularly to address the treatment of STEMI patients in Maryland. Regional Committees were originally charged to address the following three objectives:

1. Assess the current status of STEMI care in the region, including availability of resources within and adjacent to the region.
2. Develop a regional-based plan for optimizing outcomes of STEMI patients consistent with *The Maryland Medical Protocols for EMS Providers* and COMAR Title 30.
3. Continue to meet on a regular basis, as necessary, to monitor data and the implementation of the plan.

Based on the data reported in one region, the original plan for treatment and transport of STEMI patients was modified to provide better care. The process is an excellent example of an evidence-based approach to planning and collaboration among pre-hospital and hospital providers to achieve the optimal plan of care for STEMI patients. The Regional STEMI Plans are available under the Hospitals link on the MIEMSS website.

INFORMATION TECHNOLOGY

Mission: The MIEMSS Information Technology Department strives to improve Maryland's EMS systems by providing leadership, support, and guidance to the Institute and Maryland's EMS community regarding the use of information technology and the meaning of collected EMS data.

The Information Technology (IT) Department worked on four major areas of growth and improvement in FY 2013. The aim of these efforts was to improve services and resources for the EMS community and for MIEMSS, and to make those services more reliable and secure.

eMEDS[®] - The electronic Maryland EMS Data System

A major focus for the MIEMSS IT Department in FY 2013 was the continued statewide deployment of the electronic Maryland EMS Data System (eMEDS[®]), a modern, state-of-the-art system used to collect patient care reports from EMS providers. It replaces the electronic Maryland Ambulance Information System (eMAIS[®]) system that was deployed in 2004.

eMEDS[®] is commercial-off-the-shelf software provided by ImageTrend, Inc. of Lakeville, Minnesota. ImageTrend is the industry leader for this type of software, currently providing statewide patient care reporting systems to 30 states and hundreds of local counties and fire departments. MIEMSS initiated the selection process for the system in 2009, receiving bids from five vendors in early 2010. ImageTrend proved to be both technically superior and the lowest bidder. The Maryland Board of Public Works approved a contract with ImageTrend on June 9, 2010. The acquisition of eMEDS[®] was made possible by a Maryland Highway Safety Office grant and agency funds. The system is licensed for statewide use, permitting EMS Operational Programs (EMSOPs) to use eMEDS[®] at no cost and no additional burden on local funding.

The goals of eMEDS[®] are (1) to improve data collection and reporting on prehospital medical care provided by emergency medical personnel; (2) to become compliant with reporting to the National EMS Information System (NEMSIS); (3) to support research and improvements to medical care by analysis of better data; and (4) to support quality improvement of emergency medical care by EMSOPs by allowing medical directors and local leadership to analyze EMS response data.

The eMEDS[®] system is a web-based program available to providers statewide at all times. There is also a client version called "Field Bridge" that runs on laptops, allowing data collection even when no internet connection is available. For reliability, the system is hosted in a secure, professional data center in

Minneapolis, with a copy of the data, refreshed daily, stored at MIEMSS. Data entered into the system is available to the EMSOP, the receiving hospital, and MIEMSS immediately after it is entered.

The user interface of the system incorporates intuitive design, automatic entry of answers when possible (e.g., automatic time-stamping of medical procedures), and context-sensitive appearance of forms and data fields based on the type of case being treated. These features aim to improve the ease and speed of data entry so that EMS providers can focus on patient care and get back in-service quickly.

MIEMSS implemented the eMEDS[®] system by first conducting a 30-day pilot with three counties. The EMSOPs participating in the pilot were Harford, Queen Anne's, and Cecil Counties. MIEMSS prepared the pilot counties for eMEDS[®] deployment by training a small group of department leadership, who in turn trained their personnel. This train-the-trainer model worked very well with these counties and is being repeated statewide. The pilot counties began collecting live data on February 1, 2011. The results were excellent, with no major problems or interruptions of service. Providers and commanders were very satisfied with the new system. The pilot jurisdictions successfully collected reports for over 35,000 ambulance calls with eMEDS[®].

In spring 2011 MIEMSS began the statewide deployment of eMEDS[®]. That effort continued in earnest throughout FY 2012 and FY 2013. At this time most counties, special services, and commercial services in Maryland are active on eMEDS[®]. All Maryland counties have expressed interest in participating in eMEDS[®]. As of July 2013, over 1 million patient care reports had been collected by eMEDS[®].

MIEMSS continues to expand the capabilities of the eMEDS[®] system. Using Highway Safety Office grant funding, MIEMSS has been able to assist many jurisdictions to implement Computer Aided Dispatch (CAD) integration with eMEDS[®] so that the CAD system is able to supply accurate times, incident number, and vehicle information to eMEDS[®]. This integration increases the accuracy of records and makes it easier for providers to enter that information. In FY 2013 MIEMSS procured the Advanced Hospital Dashboard, which allows hospitals to access patient care records as portable document format (PDF) files from a web interface. MIEMSS also completed procurement for the Strategic Triggered Alerts and Reporting (STAR) module, which will be used for syndromic surveillance of all prehospital data in Maryland.

Expanding Capabilities

National Study Center Collaboration

The MIEMSS IT and Data Departments continued to advance the agency's ability to analyze and report on collected data by continuing its collaboration with the National Study Center for Trauma and Emergency Systems (NSC). The NSC has assisted MIEMSS in developing EMS system performance reports, GIS maps for evaluating ST-elevation myocardial infarction (STEMI) transport times, reports for producing evidence-based guidelines for EMS care, EMS vehicle crash data, and other important analysis projects.

Paperless Testing Systems

The IT Department worked with the MIEMSS' Office of Licensure and Certification on an electronic, tablet-based system to collect test scores from Emergency Medical Technician students. This system streamlines the testing process and allows results to be saved and collated for future use. Final work on this system will be completed by the end of CY 2013.

Maryland Ambulance Information Database

The IT department built and delivered the Maryland Ambulance Information Database (MAID), a permanent application to record and update the inspection and licensing of commercial ambulances using an electronic tablet-based system.

End User Services/Support Improvements

In FY 2013 the IT Department continued to apply project management services to various departmental initiatives. Help desk services were consolidated and improved, and modernization of end-user hardware and software was largely completed.

Regional Office Improvements

In FY 2013 the IT Department implemented improvements in data connections, data backups, and end-user computing systems for all five MIEMSS Regional Offices. All offices now have up-to-date hardware, software, and broadband connections adequate to support their missions.

Ongoing Missions

The IT Department continued to support existing programs in FY 2013. Highlights include:

electronic Maryland Ambulance Information System

The electronic Maryland Ambulance Information System (eMAIS[®]) was still employed by a few counties and commercial services at the end of FY 2013. eMAIS[®] will continue to be accessible until all users are transitioned onto the new eMEDS[®] system, and will then continue to be available in a “read only” capacity to provide legal reports and historical data for analysis.

Maryland Ambulance Information System

The IT Department continued to scan the Maryland Ambulance Information System (MAIS) and Commercial Maryland Ambulance Information System (CMAIS) paper patient care report forms during FY 2013 for those jurisdictions that have not converted to electronic patient care reporting. As more jurisdictions move toward a paperless environment by utilizing the eMEDS[®] system or other third party electronic patient care reporting systems, MIEMSS expects the scanning of MAIS and CMAIS forms to end completely by the end of CY 2013.

electronic Maryland EMS Data System

As described above, MIEMSS continues to monitor and improve the electronic Maryland EMS Data System (eMEDS[®]) while supporting its users and deploying the system to all jurisdictions in the state.

County Hospital Alert Tracking System

The County Hospital Alert Tracking System (CHATS), a web-based application provided by Global Emergency Resources, shows healthcare providers the status of hospitals throughout Maryland and in surrounding jurisdictions. In FY 2010 CHATS was upgraded when MIEMSS moved to HC Standard 3.0, making it more robust and more accessible to healthcare providers. The IT Department continues to support CHATS for use by hospitals throughout Maryland.

Facility Resource Emergency Database

Facility Resource Emergency Database (FRED) 2.0, in use since 2004, alerts all healthcare response partners of an incident and allows them to indicate what resources they have to lend to the response. The number of users has nearly doubled with the addition of long-term care facilities. In FY 2010 FRED was migrated into the HC Standard 3.0 application, making it more robust and more accessible to healthcare providers and integrating FRED alert messages with HC Standard messaging to hospitals and healthcare providers. MIEMSS' IT Department continues to support FRED for use by hospitals throughout Maryland.

HC Standard

The IT Department continues to support MIEMSS' Emergency Operations Department in the use and deployment of HC Standard, a patient and resource tracking system. HC Standard is an important electronic tool for Maryland's disaster preparedness. It allows instant, on-site collection in a disaster situation. Data about numerous patients can be tracked and instantly updated so that MIEMSS Emergency Operations, other agencies, and hospitals are aware of the status and location of patients and various medical resources at all times.

Trauma Registries

There are three registries currently included under the Maryland State Trauma Registry reporting process: (1) The Maryland Trauma Registry, used by 25 facilities including 9 adult and 2 pediatric designated trauma centers; (2) the Maryland Eye Registry for our single designated eye trauma center; and (3) the National Trauma Registry American College of Surgeons (TRACS) American Burn Association Registry, which represents records from the designated adult burn center and will eventually include data from the two designated pediatric burn centers. Data from the registries are forwarded to MIEMSS monthly, quarterly, and annually for reporting purposes.

In FY 2013 the Maryland Trauma Registry was upgraded to a modern web-portal version of software from Digital Innovation, Inc. This provides more powerful and flexible reporting, inclusion of prehospital patient reports from eMEDS[®], and an update of patient outcome information back into eMEDS[®].

Help Desk and User Support

A major ongoing mission for the IT Department is support of end users, both agency staff and EMS providers statewide, in using their PC equipment and applications. Objectives of the IT support group are to:

- Help customers navigate technology
- Support MIEMSS' mission, realizing that information technology is a vital tool for the use of data and information
- Create, support, maintain, and improve IT infrastructure

A dedicated and skilled support staff provides quick resolution to PC and application software issues. The IT Department continues to provide technical support to EMRC/SYSCOM, in coordination with MIEMSS' Communications Engineering Services.

Project Management

MIEMSS IT provides project management (PM) services throughout the agency for consideration and development of needed applications and services. Specific PM efforts planned for FY 2014 include completing an upgrade and migration of VMware and networking services to a new server room, developing off-site back-up capability, completing a Hospital Designation program and database, completing major updates to the Provider License Registry, and initiating an enterprise document management and data management program.

Initiatives for FY 2014

Security Improvements

In April 2013 MIEMSS completed a Cyber Security Resilience Review by the US Department of Homeland Security. In conjunction with the Maryland Information Security Policy, this review has established a baseline for the agency's information security status relative to the maturity model presented in those documents and highlighted a number of areas for improvement. The overall conclusion is that MIEMSS' network and its data are secure, but that the systems and processes providing that security need to be documented and clarified in policy and procedure. To that end MIEMSS has refocused some staff duties on the area of cyber security. In FY 2014 MIEMSS will develop and begin implementation of a Security Improvement Plan. Agency staff, as well as one or more vendor engagements, may be utilized in this effort, as well as support from the Maryland Department of Information Technology and the new Maryland Director of Cyber Security.

Continue to develop eMEDS®

MIEMSS IT plans to continue work with EMSOP system managers to improve eMEDS® and make sure it supports local operational and state data analysis needs. MIEMSS is seeking to build on the success of eMEDS® by adding additional features that will make EMS reporting more effective. Through the Maryland Highway Safety Office, grant funds have been awarded to counties to facilitate CAD integration so that 9-1-1 data and call times are automatically imported into patient care reports. In FY 2014 eMEDS® will be integrated with MIEMSS' HC Standard Patient Tracking System to facilitate patient care reporting in Mass Casualty Incident situations. MIEMSS is has implemented and will continue deployment of ImageTrend's STAR system for eMEDS®, which will enable automatic statewide

alerting from eMEDS® based on unusual trends in illness or injury. In order to stay current with NEMSIS national data standards and with ImageTrend features, MIEMSS will develop an upgrade of eMEDS® to the NEMSIS 3.0 platform during FY 2014.

Implement Provider Database System for MIEMSS Office of Licensure and Certification

The Maryland Prehospital Provider Registry (MPPR) system is currently used to track the certifications, education, and affiliations of EMS providers throughout the state. The system is technologically outdated, requires extensive maintenance, and no longer meets the operational needs of MIEMSS or the EMS community. As part of the original eMEDS® request for proposal and contract, MIEMSS secured the right to buy ImageTrend's licensure system to replace MPPR. In FY 2012 the agency was successful in completing the acquisition of ImageTrend's licensure system. MIEMSS IT assisted Licensure and Certification in configuring and deploying the new system in FY 2013 and will take this system into production in FY 2014.

The new system will provide a web-based portal for extensive self-service by the EMS community and jurisdictional medical directors. It will also automate many processes now handled manually by Licensure and Certification, resulting in much greater efficiency, better customer service, and cost reduction in tracking provider certifications and training. It will automatically synchronize staff records with eMEDS® so that both systems always have up-to-date information on provider certification status.

Improve Computer Resources, Network Reliability, and Disaster Preparedness

In FY 2014 the IT Department will continue implementation of computer hardware and software to upgrade VMware and network operations, migrate all equipment and services to a new, more robust server room, and implement off-site back-up capabilities for critical applications and services. This will include a new data back-up system, off-site data storage and system restore capability, and additional VMware tools for backing up, restoring, and upgrading computer systems. Upgrades and replacements of legacy end-user computing systems will continue with the goal of upgrading all remaining systems from Windows XP to Windows 7. It is also likely that MIEMSS will migrate email and collaboration tools to Maryland.gov, via Google Mail and its associated online applications, in FY 2014.

Strengthen Data Analysis

Data analysis capability will be expanded in FY 2014 by emphasizing reporting, analyzing, and practical applications of EMS data. MIEMSS will also continue to work with the NSC on this effort. New analytics tools in the eMEDS[®] system will become available for data analysis and quality assurance. These will be used both in-house and disseminated to EMSOPs and providers statewide to improve Quality Assurance (QA) and improve the quality of EMS care.

LICENSURE AND CERTIFICATION

Mission: To coordinate a variety of services to protect the public and promote and facilitate the development of knowledgeable, skilled, and proficient prehospital professionals who deliver emergency care in the Maryland EMS system.

Fiscal Year 2013 was a year of new projects and implementation for Licensure and Certification. It was the first full year of implementation, with new initial and refresher courses offered, for the new EMS Education Standards as outlined in the *EMS Agenda for the Future*; pilot “paperless” practical evaluations began for EMT certification; and, working in conjunction with MIEMSS’ Information Technology (IT) Department, we began building a new licensure system.

Licensure and Certification had a steady workload in FY 2013 issuing 1,931 initial prehospital provider certifications and licenses and renewing 6,568 certifications and licenses. This office worked with other MIEMSS departments by supplying provider data and trends (e.g., prehospital care provider recruitment and retention) to various statewide committees for analytical purposes.

During FY 2013 the total number of Maryland Emergency Medical Dispatchers (EMDs), Emergency Medical Technicians (EMTs), and Paramedics continued to rise and is the highest it has been in the last

five fiscal years. The number of Maryland Emergency Medical Responders (EMRs) grew in comparison to FY 2012. Although the number of Maryland Cardiac Rescue Technicians (CRTs) has decreased, this trend is expected as a result of the elimination of the national I/99 certification level and the incentive to upgrade to the paramedic level. The breakdown of Maryland providers for the last five fiscal years is shown below.

EMS Agenda for the Future: A Systems Approach

July 1, 2012, marked the implementation of the *EMS Agenda for the Future: A Systems Approach* (“the Agenda”), making FY 2013 the first full year for the new programs. The new education standards had the greatest impact on the initial EMT program. In FY 2013, 92 initial EMT courses ran to completion and 974 new EMTs were certified through the new program. Some EMT candidates that were eligible for certification in FY 2013 still need to complete portions of the testing process. Therefore, we project the number of certified providers from the new EMT program to well exceed 1,000.

Another Basic Life Support (BLS) program impacted by the Agenda was the EMR program. In FY 2013, 41 initial EMR courses ran to completion resulting in 269 new EMR providers. Additionally, the BLS Committee of the Statewide Emergency Medical Services Advisory Council (SEMSAC) began working on an EMR to EMT bridge process that will aid current EMS providers by decreasing the hours needed for EMT eligibility. Work on this process will continue into FY 2014.

The primary impact made to ALS programs by the Agenda was at the CRT level. Effective January 1, 2014, there will no longer be a nationally-recognized I99/CRT provider level. Since Maryland will continue to certify at the I99/CRT level, a statewide EMS Board-approved program needed to be created. The ALS committee of SEMSAC worked diligently in FY 2013 to create the minimum state requirements and curriculum for the Maryland CRT program.

Number of Licensed and Certified Prehospital Professionals by Fiscal Year

Level	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
EMD	995	1,027	1,099	1,088	1,183
EMR	5,922	4,795	4,594	3,436	3,481
EMT	16,778	17,241	18,325	18,295	18,993
CRT	889	882	898	849	821
Paramedic	2,529	2,713	2,753	2,924	3,071
TOTAL	20,196	20,836	21,976	22,068	22,885

NOTE: All figures include Current, Extended, Jeopardy, Military Status, and Inactive professionals. Total reflects only EMTs, CRTs, and Paramedics.

MIEMSS continued to work closely with the states of the Atlantic EMS Council to formulate BLS examinations that meet the new National EMS Education Standards. Both the initial EMR and EMT courses eligible for state certification utilized these new cognitive examinations.

Current Provider Transition

Starting with the FY 2013 recertification cycle, several mechanisms were put into place to transition current providers to meet the criteria outlined in the Agenda. At the basic level, the EMR and EMT core refresher syllabus was revised to meet the requirements for transitioning. As BLS providers renew their certifications over the next few years, they will meet the transition requirements. At the ALS level, core transition requirements for refresher programs were designed to meet the requirements for transitioning. As ALS providers renew their certifications over the next few years, they will also automatically meet the transition requirements. Course completion certificates for submission to the National Registry of Emergency Medical Technicians have been made available to the teaching agencies to supply to providers as necessary. BLS providers are expected to be transitioned by March 31, 2016, and Paramedics by March 31, 2017. For further details, refer to the MIEMSS Transition Timeline available at <http://bit.ly/TransitionTimeline>.

Online Learning Management System

Our distance learning management system, the Online Training Center, reached 24,718 registered users in FY 2013. The registered users include not only all levels of prehospital care providers, but also other healthcare professionals, such as nurses and physicians, who require access to the Online Training Center for Base Station training. In FY 2013 there were 18,216 course completions for the required 2013 Maryland Medical Protocols Update.

In FY 2013 the Online Training Center hosted 17 active online courses. Eight new courses were made available this fiscal year: 2013 ALS Protocol Update, 2013 EMT Protocol Update, 2013 EMR Protocol Update, 2013 Base Station Protocol Update, Break It To Me Gently (Death and Dying Awareness), Prince George's County eMEDS[®] course, Baltimore Regional Traffic Safety course, and ALS Medication Review for Valium and Fentanyl. Future projected courses for the next fiscal year include the 2014 Protocol Update, more awareness programs regarding death and dying, eMEDS[®] educational pieces, an online paramedic transition requirements course, and additional medication reviews.

Paperless Practical

Licensure and Certification began piloting a paperless process for the EMT practical examination. The practical examination forms are uploaded onto computer tablets and completed by the examination station evaluators. These forms are then transferred to the examination coordinator for review. The final product allows a summary sheet to be printed for the course instructor. The implementation of a paperless practical will produce a more efficient practical evaluation. Some of the positive aspects include an electronic record with no paper filing required, a more consistent practical evaluation, better access to the practical files, and better data retrieval. The EMT paperless practical evaluation process is slated for full implementation in FY 2014.

Provider Database System for Licensure and Certification

Licensure and Certification worked closely with the IT Department on implementation of the new MIEMSS certification/licensure program in FY 2013. The ImageTrend, Inc. licensure product was awarded the state contract in late FY 2012. The product will be a web-based portal, allowing providers and teaching agencies more access to the system for updating. Since ImageTrend, Inc. also provides eMEDS[®], the state's electronic patient care reporting system, there will be better integration between the two systems to afford more seamless affiliation updates and current provider certification/licensure status. Licensure and Certification will begin implementing portions of the product in early FY 2014.

MARYLAND CRITICAL INCIDENT STRESS MANAGEMENT PROGRAM

Mission: To offer crisis support services to EMS providers, firefighters, police, and other emergency services personnel involved in emergency operations under extreme stress and to help accelerate recovery of those individuals exhibiting symptoms of severe stress reaction.

The Maryland Critical Incident Stress Management (MCISM) program offers education, defusings, and debriefings conducted by a state-wide team of trained volunteers. The team consists of volunteer doctoral- or master-level psychosocial clinicians interested in working with emergency services personnel and fire/rescue/law enforcement peer-support individuals trained in stress management. Volunteer regional coordinators are responsible for specific geographic areas of the state and serve

as points of contact, through local 9-1-1 centers and SYSCOM, for critical incident stress management.

In FY 2013 MIEMSS offered several CISM courses. Over 60 EMS and mental health providers received initial CISM training. More than 30 additional providers received CISM refresher training. Three of the training sessions offered were funded through the Maryland Department of Health and Mental Hygiene with funds from the Hospital Preparedness Program provided by the Assistant Secretary for Preparedness and Response, US Department of Health and Human Services. In the coming year, the focus of the MIEMSS CISM program will be on increasing training opportunities and on enhancing coordination between the numerous teams that exist throughout the state.

MEDICAL DIRECTOR'S OFFICE

Mission: To provide leadership and coordination for State medical programs, protocols, and quality assurance; to liaison with the regional programs and clinical facilities; and to promote creative, responsive, and scientifically sound programs for the delivery of medical care to all citizens.

The 18th Annual EMS Medical Directors' Symposium was held at the James N. Robey Public Safety Training Center in Marriottsville, Maryland, on April 10, 2013. It was attended by the Regional, Jurisdictional, and Commercial Ambulance Service Medical Directors, Base Station physicians and coordinators, the highest jurisdictional officials, Quality Assurance officers, and MIEMSS personnel. This year's keynote speaker was Kevin Seaman, MD, Emergency Medical Director, Howard County Department of Fire and Rescue Services. Dr. Seaman's presentation, "Care for the Living, Delivering News of Death to Grieving Family Members," informed attendees how to deliver death notification to the survivors, who may be families, loved ones, and friends of the cardiac arrest victim and are also, often, the forgotten patients. Other Symposium presentations included:

- "One Patient, Seven Lives, Infinite Possibilities: From Dispatch to the Operating Room" presented by Ciara Gee, BS, NREMT-P, CPTC
- "State of the State" presented by MIEMSS Executive Director, Robert R. Bass, MD, FACEP
- "TOR: The Impact on Medical Examiner Investigations" presented by Dawn Zulauf, RN, F-ABMDI

- "Winds and Blizzards and Floods – Oh My! Maryland's Response to Superstorm Sandy" presented by Lisa Chervon, BA, NREMT-P; Bill Adams, BS, CCEMTP; and Randy Linthicum, NREMT-P
- "Maryland's Results from the National Pediatric Readiness Project: How Ready are Emergency Departments to Care for Our Children" presented by Cyndy Wright-Johnson, MSN, RN, and Allen Walker, MD
- "Commercial Ambulance Services Interfacing with Jurisdictions" presented by Richard Alcorta, MD, FACEP

eMEDS®, an electronic patient care reporting system supplied by ImageTrend, Inc. and built upon the National EMS Information System (NEMIS) data set, has been implemented by 21 jurisdictional EMS Operational Programs (EMSOPs) and 24 commercial companies.

The Office of the Medical Director (OMD), in collaboration with the Jurisdictional Medical Directors, continues to monitor and provide feedback to EMSOPs on the Helicopter Utilization Database. Most recent data confirms that EMS providers are very compliant with *The Maryland Medical Protocols for EMS Providers* and the use of medevac resources has been demonstrated to save time and be of clinical benefit to patients.

The 2013 protocol updates and revisions for *The Maryland Medical Protocols for EMS Providers* were implemented statewide on July 1, 2013. An unabridged electronic version of the 2013 Protocols is available on the MIEMSS website (www.miemss.org). Also available online are the separate updated pages in a single PDF file. New this year, MIEMSS is offering an unabridged, half-size (5" x 7") spiral-bound protocol manual for sale.

The OMD welcomed Ian Bussey, NREMT-P, as the new Protocol Administrator. Mr. Bussey will continue the mission of the Protocol Administrator and work with the State EMS Medical Director maintaining the protocols, tracking protocol changes, conducting literature reviews, coordinating the Protocol Review Committee meetings, and providing a field provider's perspective on issues.

This office continues to support the Maryland Regional National Disaster Life Support (NDLS) Coalition. This year, courses were held at Maryland Fire and Rescue Institute Headquarters and the Howard County Health Department. There were two Basic Disaster Life Support (BDLS) classes with a total of 99 students and one Advanced Disaster Life Support (ADLS) class with 38 students. Ian Bussey has taken on the responsibility of Maryland Regional NDLS Coalition Coordinator.

In FY 2013 five hospitals applied for re-designation as MIEMSS-approved Base Stations. The MIEMSS Base Station communications course was taught at multiple hospitals and, as a result, 456 Base Station certificates were issued to emergency department physicians and nurses with 4 new Base Station Instructors certified.

This past year, the OMD dealt with medication shortages, which have been variable in severity, length of shortage, and impact on the system. Through FDA and ASHTO references, alternate vendors or manufacturers were identified to supply essential EMS medications.

CHEMPACK containers are placed strategically around the State to allow for rapid deployment in the event of a significant nerve agent or organophosphate exposure. The CHEMPACK program is an extension of the Strategic National Stockpile Program. Multiple exercises were conducted with Maryland State Police to improve the efficient delivery of the CHEMPACK's time-critical medications.

Children's National Medical Center, the National Study Center, and the OMD have completed the review, writing, analysis, and submission of four articles based on the National Prehospital Evidence-based Guideline (EBG) Model Process for Emergency Medical Services for the National Highway Traffic Safety Administration. The two protocols addressed were 1) Helicopter EMS utilization and 2) appropriate pain management for the traumatically injured patient. The EBG protocol for the traumatically injured patient has been accepted for publication in the journal *Prehospital Emergency Care*.

Dr. Richard Alcorta, Maryland State EMS Medical Director, has also been an active contributor to the National Association of State EMS Officials "Model EMS Clinical Guidelines Project" as the Toxin and Environmental Emergencies Protocol Subcommittee leader. The intent of this ambitious project is to provide standardization of EMS care across the nation with evidence-based (where available) or consensus-approved EMS protocols.

QUALITY MANAGEMENT

Mission: To support both MIEMSS and the EMS community in their continuous quality improvement initiatives and commitment to a customer-based way of doing business. Successfully accomplishing this is not simply dependent upon recognizing that the ultimate customer is a patient in need of timely, proficient, and compassionate care, but understanding and improving the processes that maintain a well-functioning EMS system for the delivery of quality medical care.

MIEMSS initiated its quality management implementation through the development of an EMS-specific, Juran-based program. Over the years MIEMSS has taken advantage of state-supported resources and drawn upon other individuals who practice quality management principles within their respective EMS setting or other work settings. These diversified resources helped define Maryland's EMS community needs and tools for the improvement of services and customer relationships.

Managing for Results

For the past 15 years, MIEMSS, like all State agencies, has been required to submit Managing for Results (MFR) updates along with its fiscal year budget requests to the Maryland Department of Budget and Management. This phased-in planning process began with the establishment of the MIEMSS Vision, Mission, and Principles statement through a customer-focused strategic planning process. MIEMSS has again met those requirements, which include re-evaluation of key goals, establishment of subsequent objectives and strategies, development of associated action plans, and creation and monitoring of performance indicators.

KEY GOALS AND OBJECTIVES

Goal 1. Provide high quality medical care to individuals receiving emergency medical services.

Objective 1.1 Maryland will maintain its trauma patient care performance above the national norm at a 95% or higher statistical level of confidence.

Objective 1.2 Increase by 5% annually the number of prehospital acute ischemic stroke patients receiving tPA medication upon hospital arrival and within three hours of symptom onset.

Goal 2. Maintain a well-functioning emergency medical services system.

Objective 2.1 Transport at least 89% of seriously injured patients to a designated trauma center throughout 2013.

Team EMS

An innovative approach to Quality Management education and application in the real world of EMS management was developed in collaboration with the MIEMSS Region V administration; the strategy was implemented in 1996 and has been updated to reflect present standards. MIEMSS staff and a cadre of volunteer instructors from the EMS community developed ways for company and jurisdictional managers to plan for, measure, maintain, and improve quality services. Techniques taught range from brainstorm-

ing causal relationships to data analysis interpretation; topics include quality improvement (QI) team creation and meeting quality assurance (QA) standards established under state law. Jurisdictions and Regional EMS Advisory Councils have utilized this training for planning purposes, and more than 500 providers have attended statewide and special training sessions for EMS Operational Programs (EMSOPs) on a variety of subjects from indicator development to data interpretation.

Beginning in 2002, and in accordance with COMAR Title 30 regulations, all Maryland jurisdictional programs have implemented their own QA and QI plans. During this evolutionary process, Team EMS has provided the skill sets for effective and continued success in meeting the goals of these plans. Particular interest has focused on the role of jurisdictional and local QA/QI managers and the skills to be an effective quality leader. To help strengthen the role of this important link to quality services, Title 30 was amended in October 2007 to define and mandate the functions of this officer at the operational program level. The two-day core curriculum was modified and presented this year at four EMSOP educational seminars.

electronic Maryland EMS Data System Implementation

MIEMSS was awarded annual grants for the past five years from the Maryland Highway Safety Office to implement and upgrade its electronic patient care reporting (ePCR) system known as the electronic Maryland EMS Data System (eMEDS®). The primary goal was to have Maryland's prehospital care data meet the gold compliance standards set forth by the National Emergency Medical Services Information System (NEMSIS). Starting in February 2011, three pilot EMSOPs implemented eMEDS® as their primary ePCR. Presently, there are 21 jurisdictional EMSOPs utilizing eMEDS® for direct prehospital patient care data entry and self-report writing for program monitoring, evaluating, and improving. These programs account for over 1 million records registered as of July 2013. Additionally, a matching grant program for all EMSOPs using the eMEDS® application and wanting to link their EMS Computer Aided Dispatch (CAD) records was continued for a third year. Presently, 13 EMSOPs have completed CAD integration contracts and another 8 are at various stages of implementation. MIEMSS has secured

funding in the next fiscal year for the remaining four EMSOPs.

EMS Surveillance Measures

MIEMSS has maintained several EMS system surveillance priorities based on routine data review, customer requests, and research outcomes. Hospital Yellow Alert demand is monitored at state, regional, jurisdictional, and hospital-specific levels through our online County Hospital Alert Tracking System (CHATS). Monitoring on this system keeps all entities updated on current system response capabilities, as well as historical trends. This monitoring (especially during the winter months and flu season) and hospital strategies that address high demand for emergency department services help improve the availability of this vital service system-wide. Additionally, Yellow Alert data form one measurement in the Maryland Department of Health and Mental Hygiene's (DHMH's) syndromic surveillance programs.

The Helicopter Utilization Database was created after field protocols were revised for helicopter scene request transports in 2008. This database accounts for all helicopter requests for transport, independent of actual transport mode outcome, and permits the requesting EMS managers/medical directors to conduct case reviews. The primary goal is to utilize this transportation resource for only the most severe, time-critical, scene incident patients statewide.

Patient conditions associated with EMS response to heat-related symptoms were monitored daily during the summer of 2012. Updates on these cases were reported every 12 hours to EMS system managers for the geographic monitoring of potential outbreak locations statewide. Overdose cases were retrospectively reviewed for the past three years for both temporal and location characteristics by the Maryland DHMH.

Data Confidentiality

MIEMSS maintains or has access to eight confidential databases used in ensuring quality EMS care delivery. The Data Access Committee was formed to ensure that all data and requests for information are expedited efficiently and accurately while ensuring patient and provider confidentiality at all times. Since January 2000 over 1,500 data requests have been tracked and facilitated.

REGIONAL PROGRAMS AND EMERGENCY OPERATIONS

Mission: to provide a liaison between MIEMSS' central office and local EMS agencies; manage MIEMSS programs at the local level; work closely with the local governmental entities, training centers, and emergency medical services providers; and staff regional EMS Advisory Councils. Regional offices also provide support in the area of planning, coordination, and response for health and medical preparedness for catastrophic events.

Field Operations consists of Regional Programs and Emergency Operations. There are five Regional Offices throughout the state. Each office consists of at least one regional administrator and a supporting staff member. They are responsible for monitoring the operation of the regional EMS system, acting as advocates for the services in their region in the development of state policies, and representing MIEMSS in the implementation and maintenance of these policies. Emergency Operations plans for and responds to significant events around the state. In the event of a large scale incident, regional administrators are expected to be available to local resources to assist in the response. In many cases, they will be the first state representatives on the scene.

Field Operations is now fully staffed. This year we welcomed David Stamey as the Region II Administrator, Jonathan Bratt as the Region V Administrator, Amy Robinson as the Region V Associate Administrator, Anna Sierra as the Associate Administrator in Region IV, and Charles Dorsey as the Administrative Aide for Field Operations and Region III.

Regional EMS Advisory Councils

Each region has an EMS Advisory Council that provides the focal point for the coordination of EMS planning and activities among the jurisdictions. The Councils provide a means for neighboring jurisdictions to collaborate on many issues such as conferences, training, quality improvement processes, emergency response exercises, and mutual aid activities. The regional offices act as staff for the Advisory Councils to schedule meetings, manage records, research information, facilitate discussions, and represent MIEMSS at meetings.

Grant Programs

Regional offices facilitate the distribution of funds to support local programs from several sources. For an accounting of the funds administered through the regional EMS offices, see page 32. Enhancements to local programs that were made as a result of those funds include the following:

Department of Health and Human Services – Hospital Preparedness Program

The Hospital Preparedness Program (HPP) provides funding to local EMS agencies to enhance their emergency preparedness. A complete accounting of expenditures, according to the priorities prescribed by HPP, can be found on page 72. This past fiscal year, funds were used to enhance and expand patient tracking systems, upgrade communications systems, and increase caches of critical equipment required to provide care to special needs patients.

The Region I Office is the contact for HPP grant funding, ensuring applications are completed and submitted and funds are expended appropriately. The Region I Office was also the lead for a Region I and Region II HPP patient tracking exercise held on May 17, 2013. This exercise introduced and formalized healthcare facilities and staff in Allegany, Frederick, Garrett, and Washington Counties with the HC Standard patient tracking software and equipment purchased with HPP funds.

The Region III Office continued the expansion of the region's electronic patient tracking capabilities in FY 2013. This expansion utilized HPP funds and Urban Area Security Initiatives (UASI) grant funding to procure additional hardware necessary to complete the cache, which consists of four patient tracking kits and accessories.

The Region IV Office assisted Somerset County with the submission of a grant to improve the medical surge capability in conjunction with EMS departments in the county. The HPP funds were utilized to equip a rapidly deployable trailer with supplies for treating approximately 40 patients.

Urban Area Security Initiatives

In Region V Emergency Response System (ERS) grants were awarded to both Montgomery and Prince George's Counties to develop and implement responses to mass casualty events in the National Capital region. MIEMSS manages both the administrative and contractual components of the project for Montgomery County ERS. As part of this effort, both Montgomery and Prince George's Counties have completed purchase of patient tracking equipment and

full implementation is expected in the fall of 2013. A forward movement of patient and hospital evacuation tabletop exercise was conducted in April 2013 for the National Capital region. A total of 119 individuals from EMS, emergency management, hospitals, law enforcement, nursing, and rehabilitation centers attended. The “After Action” report will be the basis for planning for a region-wide full scale exercise in 2014. The Region V Office is coordinating closely with the ERS programs in Northern Virginia and Washington, DC, to share educational programs, coordinate emergency plans, and conduct mutual aid exercises.

The Region III Office works closely with the Region III Health and Medical Taskforce, which serves as the Health and Medical Committee of the Baltimore Urban Area Working Group advising on the distribution of UASI funds on health and medical projects and as the regional healthcare coalition for the management of HPP funds. They are in a unique position to coordinate funding to support healthcare preparedness projects.

Radio Grant Program

All regional offices worked closely with MIEMSS Communications Engineering Services to complete the replacement of wideband EMS radios by January 1, 2013, with narrowband-capable equipment. The MIEMSS radio grant program provided funding to upgrade the radios.

Computer Aided Dispatch Grant Program

MIEMSS offered computer aided dispatch (CAD) interface grants with funding provided by the

Maryland Highway Safety Office and the National Highway Transportation Safety Administration. The CAD Interface Grant was a 60/40 matching grant program allowing MIEMSS to reimburse an EMS Operational Program (EMSOP) 60% of the costs associated with services performed by ImageTrend, Inc. to establish a CAD Interface to the electronic Maryland EMS Data System (eMEDS®). To date 26 of 27 EMSOPs have been funded and the CAD is operational in 18.

Other MIEMSS-Funded Grants

MIEMSS provides funding from its budget for several programs. The Advanced Life Support (ALS) Training programs provide funds to support initial and continuing education for ALS providers and candidates. The Emergency Medical Dispatch (EMD) program provides funding for similar programs for emergency services dispatchers. The 50/50 Matching Equipment Grants support the purchase of automated external defibrillators (AEDs) and diagnostic equipment by local EMS agencies and companies.

Inventory and Administration

Each regional office is responsible for tracking the activity and progress of all grants that it receives. This includes ensuring that periodic reports are completed and inventorying any physical assets gained as a result of the grants, per state and federal requirements. This also includes an annual inventory of assets on loan to local jurisdictions and the inventory of equipment obtained from previous grants.

MIEMSS Grant Disbursements (FY 2013) by Region

	50/50 Matching Fund Grant for AEDs, Monitor Defibrillators and Upgrades	ALS Training Funds	Emergency Dispatch Programs	HPP Bioterrorism Grants BT-IX (FFY 2012)	DOT Highway Safety CAD Interface Grants (FFYs 2011-2013 to date)	Totals By Region
Region I	\$46,790	\$30,000	\$2,446	\$8,484	\$30,643	\$118,363
Region II	\$51,560	\$20,000	\$5,289	\$13,334	\$20,950	\$111,133
Region III	\$113,370	\$100,000	\$12,026	\$46,667	\$47,814	\$319,877
Region IV	\$91,220	\$72,000	\$18,371	\$38,182	\$62,748	\$282,521
Region V	\$99,060	\$80,000	\$11,868	\$33,333	\$12,806	\$237,067
Total	\$402,000	\$302,000	\$50,000	\$140,000	\$174,961	\$1,068,961

NOTE: Does not include all grants described on pages 31 and 32.

Medical Direction

STEMI Designation and Planning

Each regional office continues to work closely with its established Medical Review Committee. The Region I committee has continued to meet semi-annually since July 2010 to review the Regional ST-elevation myocardial infarction (STEMI) plan, evaluate the data set for STEMI cases, and assess outcomes of STEMI patients. Region I continues its effective activation from the field initiative, which allows ALS providers to activate the Cardiac Cath Intervention Team at a hospital while assessing the patient at the scene of the call. This activation from the field by EMS providers reduces the EMS-to-balloon (E2B) times drastically in the rural setting of Western Maryland and ensures increased survivability and positive outcomes with STEMI patients. Additional focus is currently on the STEMI transfer center and reducing E2B times for these patients. The Region I Administrator has been actively attending the Western Maryland Regional Medical Center's Door-to-Balloon Committee, decreasing communication barriers between prehospital providers and hospital staff.

The Region II STEMI Committee continued to meet on a regular basis and recently agreed upon a common reporting format. This format will be utilized for continuous quality improvement and enable the committee to provide timely feedback to local EMS systems.

The Region III STEMI Committee continued to meet quarterly throughout the year to review data submitted by the Region's Cardiac Interventional Centers (CICs). The group continues to identify strengths and weaknesses in the Region's STEMI programs and to develop and share best practices among their partners to attain the highest level of coronary care. Having achieved their goal of development of common terminology, working definitions, and a uniform reporting structure, the Region III STEMI Quality Assurance/Quality Improvement (QA/QI) subcommittee was disbanded. This subcommittee also developed a standardized STEMI feedback form to be used throughout the region.

The Region IV STEMI Committee continued to meet throughout FY 2013. The EMS Board approved a pilot study by Talbot County Department of Emergency Services modifying time parameters for the transport of STEMI patients by EMS units directly to CICs. This data driven outcome study has demonstrated a reduction of 9-1-1 to profusion time, leading to a modification of *The Maryland Medical Protocols for EMS Providers* on July 1, 2013. All Region IV

hospitals are providing data along with its out-of-state partners on the treatment and transport parameters of STEMI patients. The STEMI QA/QI Committee continues to meet to review data and enhance facility best practices.

The Region V STEMI Committee reconvened to review its regional plan and include 2013 Protocol updates. The STEMI QA/QI Committee will be meeting to discuss data collection and share best practices to improve door-to-balloon times. The inclusion of American Heart Association's Mission: Lifeline data will allow for a non-biased review of hospital data regionwide.

Base Stations

In cooperation with the Medical Director's Office, regional offices assist with site visits required to approve hospitals that provide physicians' orders to prehospital providers. The regional offices also have taken the lead in coordinating scheduling and supporting the Base Station Course, which is required for the physicians and hospitals already designated as Base Stations.

Quality Assurance Committee – MIEMSS

The MIEMSS staff that provides the instruction for QA classes has been meeting on a regular basis. As part of these regular meetings, they have streamlined the previous course and reduced the initial training to a one and a half day program. They have also reviewed the course outline and changed lesson plans to enhance the learning experience for those in attendance. A second major objective of this committee has been the development of a company-level QA course to assist jurisdictions and regional Medical Directors in following county QA plans that are already in place. Classes were held at MIEMSS Headquarters in Baltimore and in Howard and Talbot Counties. These programs were well attended and included QA officers from the commercial sector as well as volunteers and municipal services. The committee looks forward to providing additional training throughout the state and to pilot the jurisdictional company level QA program. The MIEMSS QA committee intends to reach out to each region for input and participation in future meetings.

Quality Improvement

In Region I Allegany and Garrett counties have continued work on their QA and QI committees and have been meeting regularly to ensure proper EMS coverage in the region. Both counties continue to

implement SWOT (strength, weaknesses, opportunities, and threats) initiatives. Allegany County completed a revisit of its previous SWOT, which will determine progress and show a clear path forward for its EMSOP. The continued leadership and direction provided by both counties' Emergency Services Boards is a testament to the SWOT initiative. The Region II Office helped to coordinate a QA officer's course for Washington County. This class was held in Howard County and focused in part on revising Washington County's QA plan. Members from Washington County Department of Emergency Services and volunteer corporations attended.

The Region IV Office, in conjunction with the Talbot County Department of Emergency Medical Services, hosted a class in Easton for QA officers and providers who were unable to attend programs at MIEMSS or in Western Maryland.

Communications Systems

The Communications Engineering Services Department at MIEMSS completed the narrowbanding required by the Federal Communications Commission prior to the January 1, 2013, deadline. The new Region IV Emergency Medical Resource Center (EMRC) completed its first full year of operation in April 2013. Additionally, Emergency Operations and the regional offices have been working with emergency response partners to connect them to the Digital EMS Telephone System (DEMSTEL), an independent voice over internet protocol telephone system that does not depend on the publically switched telephone systems to operate. DEMSTEL phones are connecting hospitals, health departments, emergency operations centers, state police, emergency management agencies, and other response partners throughout the state. Through the hard work of Communications Engineering Services and the coordination of the regional offices, 43 additional sites have been connected since January 2012, bringing the total to 173 of the 225 planned sites.

electronic Maryland EMS Data System

Region I reports that both Allegany and Garrett County have been using the eMEDS[®] patient care reporting system since October 2011. Region II jurisdictions are successfully utilizing eMEDS[®] for patient care reporting. Washington County converted almost two years ago and Frederick County converted earlier this year. As of July 1, 2013, all Region III jurisdictions have transitioned to the eMEDS[®] system. A statewide eMEDS[®] steering committee was

formed by the MIEMSS Region III Office in FY 2013 and includes representation from EMS and hospital personnel. The group was tasked with identifying best practices for the integration of eMEDS[®] into the Maryland EMS System and continues to meet quarterly. In Region IV all nine jurisdictions have transitioned to the eMEDS[®] system. In Region V Calvert and St. Mary's Counties are now operating on eMEDS[®].

Voluntary Ambulance Inspection Program

The regional offices continue to perform inspections of ambulances under the Voluntary Ambulance Inspection Program (VAIP).

These inspections ensure that each unit is stocked with specific equipment and meets the response criteria developed by the VAIP Committee. Statewide, 320 units were inspected this year. The inspections are valid for two years. MIEMSS has standardized the process of inspection and interpretation of the standards. Now all regional offices cooperate to inspect units across the state to ensure a consistent assessment of the units.

Both counties in Region I are actively participating in the VAIP and continued to embrace the process. In Region II, both Washington and Frederick counties are actively participating in the VAIP process. Anne Arundel, Carroll, Harford, and Howard Counties in Region III are fully VAIP certified. In Region IV full participation has expanded to four counties. While not mandated, inspections in the other jurisdictions are on the increase. Three of the five jurisdictions in Region V have met requirements for the VAIP countywide.

Conferences and Training

EMS Care 2013 was held in Ocean City, Maryland, in May. Three days of preconference offerings were followed by the full two-day conference. Over 300 participants attended for a weekend full of quality educational and networking opportunities.

The 11th Annual Miltenberger Emergency Services Seminar, held in April 2013, was another success. Teamwork between the Region I Office, the local hospitals, and other local agencies and institutions has developed a supportive learning environment that offers fire, EMS, EMD, and nursing topics. The first Region I *A Night for Stars* program was held at the Friday preconference to recognize emergency services providers and healthcare workers for their efforts in saving two citizens who experienced sudden and debilitating cardiac events. Work has already begun for the 12th annual program for 2014, to be held April 4 and 5 at the Wisp Resort in McHenry, Maryland.

In Region IV the Peninsula Regional Medical Center held its Annual Trauma Conference in Ocean City in November 2012. The conference once again provided an outstanding opportunity for physicians, nurses, and prehospital providers to network and listen to speakers on current critical issues in the field of trauma care. The Winterfest Conference continued its successful run with a conference held on Tilghman Island in January 2013. Preconference programs included presentations by the EMS for Children Program, a 12-hour Emergency Medical Technician (EMT) skills class, and opportunities for required continuing education recertification.

In Region V the 2012 Pyramid Conference was held October 27 and 28 in Clinton, Maryland.

Support for Educational Programs

In addition to the conferences described above, the regional offices support many other educational programs that are innovative and intended to address issues specific to a particular region. Some arise from needs identified through the quality improvement processes. Many regional offices also support protocol rollout classes.

The regional offices also act as resources for local educational programs and institutions, ensuring there are always adequate resources and basic training programs available. Often the regional offices coordinate courses with community colleges, fire academies, and local hospital and association programs. Education committees and councils staffed by the regional offices bring the program coordinators together and identify priorities for training. The regional programs staff continues to assist with and comply with all National Incident Management System Capability Assessment Support Tool (NIMSCAST) requirements.

The regional offices are also responsible for conducting written certification and licensure examinations. This fiscal year the regional offices conducted 317 individual certification exams in their offices (see report for Licensure and Certification on page 26 for more information on testing, which includes exams conducted in classes by regional offices).

Illness and Injury Prevention

All regional programs continue to support a variety of education and prevention activities through their EMS Advisory Councils.

Health and Medical Emergency Preparedness

Response and Activations

The regional offices are the first line of response by MIEMSS to support local jurisdictions during significant emergency incidents and pre-planned mass gatherings. This year MIEMSS supported state agencies and local EMS jurisdictional programs during several events including a major water main break affecting healthcare facilities in Chevy Chase, activation for Tropical Storm Andrea, a freight train crash in Rosedale involving an explosion, several severe storms and winter weather events, a full failure of information systems at Montgomery County hospitals, and the collapse of a parking structure in Montgomery Village. In most of these responses, MIEMSS personnel staffed the State Emergency Operations Center at MEMA or responded to the scene to enhance communications with the EMRC and hospitals.

In late October 2012, "Superstorm" Sandy tested MIEMSS's capabilities in assisting local communities and neighboring states to handle the effects of a large-scale, exceptionally destructive weather event. Garrett County was hit especially hard by this storm. The Region I Administrator, along with many other local, state, and federal representatives, staffed the Garrett Emergency Operations Center to mitigate the disastrous effects of the storm. MIEMSS was tasked with coordinating ambulance strike teams to assist search and rescue crews that went door-to-door in efforts to account for all citizens. The storm left 85% to 90% of Garrett County without power and devastated the County's infrastructure. Personnel and EMS units from Harford, Frederick, and Washington Counties, as well as commercial companies Butler Medical Transport, Transcare Ambulance, and Lifestar Response, assisted with the search and rescue effort.

Ambulance strike teams were assembled from crews throughout the state to assist those in Maryland and others affected by Sandy. Personnel from the Region III Office and the State Office of Commercial Ambulance Licensing and Regulation (SOCALR) were deployed to assist with search and rescue missions and with recovery efforts in New Jersey. All the regional offices supported this response by contacting and coordinating ambulances from Baltimore City and Washington, Charles, Queen Anne's, and Talbot Counties; SOCALR coordinated assistance from Lifestar Response and Transcare Ambulance. Over 15 ambulances were sent to assist New Jersey EMS with daily 9-1-1 response and storm-related calls.

MIEMSS personnel also coordinated the response from the Baltimore Regional Incident Management



Team and assisted the New Jersey EMS Operations Center in Trenton by coordinating the deployment of resources from multiple states from staging centers into the field.

The Region IV staff, along with other MIEMSS staff, assisted local authorities and agencies in Somerset County, Maryland, with evacuation, triage, and transport of citizens as a result of this significant weather event. Ambulances crews from throughout the region volunteered their time to transport patients to hospitals as needed.

Health and Medical Preparedness Coalitions

Staff of the Region I Office supported local jurisdictions by serving on numerous committees relating to the coordination of health and medical activities within the region, ensuring timely and effective communication of relevant EMS health and medical preparedness issues.

The Region II Administrator is currently coordinating with health and medical partners on several important issues, one of which is the establishment of a countywide training program, a collaboration between Hagerstown Community College and Washington County, that will be partially funded by ALS grant funds.

The Region III Health and Medical Taskforce is a subcommittee of the Baltimore Urban Area Working Group. The committee is chaired by Christina Hughes of Medstar Franklin Square Medical Center. The Taskforce continued their work throughout FY 2013 to enhance Region III's emergency preparedness and response capabilities. A one-day moulage training workshop was held on four occasions to provide valuable training for exercise coordinators throughout the region. The group is currently finalizing operational plans for the Region III Alternate Care Site and Training Center and continues to roll out the electronic patient tracking system within the region.

As one of its health and medical initiatives, the Region IV Office participated in a community needs assessment in Caroline County. This cooperative effort of the Caroline County Commissioners and

Shore Health Systems has implications for several areas in the region. This project resulted in several action steps to provide additional health resources to Caroline County and stimulate discussion on further initiatives to be undertaken. The Region IV Office also supported several hospital-based drills and the Delmarva Regional Health and Medical Advisory Group.

The Region V Office EMS Advisory Council created a Diversion Taskforce with representatives from hospitals and EMS to discuss best practices and future data review. The region continues to work to improve hospital cycle times and reduce the use of diversion hours. MIEMSS also collaborates closely with the Metropolitan Washington Council of Governments to coordinate activities across the National Capital region. This includes participation in multiple regional exercises, coordination of emergency communications procedures, and the expansion and integration of HC Standard and patient tracking across the National Capital region.

Emergency Response and Exercises

MIEMSS Regional Offices and Emergency Operations support numerous exercises and events throughout the state. Some of the more notable activities this past fiscal year included:

- Baltimore County mass fatality exercise
- Baltimore City high-rise exercise
- Upper Chesapeake Health evacuation exercise
- National Disaster Life Support exercise
- Towson University operation of the mass-casualty STAT exercise
- Harford County Base Realignment and Closure (BRAC) exercise
- National Capital Region and NCR-ERS exercises
- Southern Maryland Regional Tabletop
- Region V Medical Surge

Field Operations Support Team Events:

- Baltimore Grand Prix
- Preakness Races
- US Presidential Inauguration

CHEMPACK

MIEMSS continues to coordinate the CHEMPACK portion of the Strategic National Stockpile in Maryland. This includes monitoring access to the sites and coordinating the multiple site visits of the Centers for Disease Control and Prevention to update medications and inspect facilities. The CHEMPACK program places chemical agent antidotes into forward locations to ensure rapid deployment should there be an exposure to a large

group of people. This year Maryland State Police Aviation Command (MSPAC) and MIEMSS conducted four CHEMPACK loading exercises. During these unannounced drills, duty crews were alerted and requested to access and load the training version of the CHEMPACK and prepare to transport the medications to a specific site. Each exercise was monitored and timed by MSPAC and the EMRC to document the process and recommend improvements in the time it requires to deploy the asset. Although aircraft never actually transported the medications, many lessons were learned and are being incorporated into new policies and procedures, which will be implemented in 2014 when deployment of the training pack is conducted in coordination with planned full-scale exercises.

Health and Medical Monitoring Application

The regional offices made great strides in enhancing participation in the online use of the County Hospital Alert Tracking System (CHATS). Nearly all hospital and 9-1-1 centers are using CHATS to change their own status and get alerts about other status changes. The use of the patient tracking portion of HC Standard continues to be expanded and utilized. This year it supported the evacuation of nursing homes and hospitals. The Facility Resource Emergency Database (FRED) function of the system was activated numerous times to alert health and medical response partners of incidents and exercises and was used to assess resource availability for beds, medications, and other supplies needed for the response. More enhancements were added this year, including a Psychiatric Bed Registry.

Preparedness Planning

Due to lessons learned from “Superstorm” Sandy, MIEMSS Emergency Operations began a process of establishing formal Ambulance Strike Teams and EMS Taskforces to respond to requests for assistance rapidly and in the most effective manner possible. A committee representing public safety and commercial EMS resources was established to define the alerting processes, training and equipment requirements, and pre-identify associated costs and expenses. The goal has been set to have crews on call on a rotating basis so that the first teams are en route within six hours of a request for assistance. Until formal teams can be established, the procedures for alerting and requesting teams should be ready by fall 2013. Some formal teams are expected to be prepared for deployment by the 2014 hurricane season.

STATE OFFICE OF COMMERCIAL AMBULANCE LICENSING AND REGULATION

MISSION: To provide leadership and direction regarding the commercial (private) ambulance industry in Maryland and to protect the health, safety, and welfare of individuals utilizing these services. This includes 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.

**Operating Statistics:
July 2012–May 2013**

- 1 New Basic Life Support (BLS) Service License Issued
- 1 New Advanced Life Support (ALS) Service License Issued
- 2 New Specialty Care Transport (SCT) Service Licenses Issued
- 3 New Neonatal (NEO) Service Licenses Issued
- 60 Intra-Cycle Vehicle Licenses Issued
 - 17 Semi-Annual Vehicle Licenses
 - o 10 BLS
 - o 7 ALS
 - 27 New Vehicles Added
 - o 21 BLS
 - o 6 ALS
 - 16 Vehicle License Changes
 - o 2 Licensing Downgrades (ALS to BLS)
 - o 8 Licensing Transfers (BLS to BLS, ALS to ALS)
 - o 6 Licensing Upgrades (BLS to ALS, SCT to NEO)

Between FY 2008 and FY 2013, the total number of commercial service licenses issued increased:

- 40% increase in SCT
- 167% increase in NEO
- 33% increase in Aeromedical (AIR)

Between FY 2008 and FY 2013, the total number of commercial ambulances operating increased:

- 23% increase in BLS
- 44% increase in ALS
- 91% increase in NEO

Annual Inspections 2012

40 Commercial Ambulance Licenses Issued

- 36 Ground Ambulance Services
 - o 9 BLS
 - o 12 ALS
 - o 7 SCT
 - o 8 NEO
- 4 Air Ambulance Services

430 Vehicles Inspected and Licensed

- 258 BLS
- 145 ALS
- 21 NEO

In FY 2013 the State Office of Commercial Ambulance Licensing and Regulation (SOCALR) marked its twentieth year of operation serving the commercial ambulance industry. The department's trend of repeated annual growth validates the value and need for commercial ambulance services in Maryland.

Due to the ever-changing dynamic of the commercial ambulance industry and its trending growth, SOCALR saw the need to bring on additional staffing to continue its mission of ensuring patient and provider health, safety, and welfare along with maintaining the mission and vision of MIEMSS. SOCALR is now staffed with two full-time employees (Director and Licensing Specialist) and four part-time contractual employees (Ambulance Inspectors).

SOCALR is committed to expanding and enlarging its responsibilities by developing strategies and implementing plans that demonstrate the positive impact of this office on the Maryland EMS System. We are currently analyzing and assessing fixed-wing transports, both domestic and international, for admission to some of Maryland's finest hospital systems. SOCALR will ensure compliance with state regulations and medical oversight for quality assurance purposes in order to maintain alignment with our mission.

Beyond licensing, SOCALR continues to play a vital role in the EMS community. Regular duties include compliance with federal, state, and local laws, quality assurance and quality improvement, and ambulance safety.

SOCALR has developed a strong partnership with the EMS for Children (EMSC) Program by promoting ambulance transport safety and committing to providing pediatric educational opportunities such as the S.T.A.B.L.E. Program (more information can be found in the EMS for Children report on page 12).

The SOCALR team also remains committed to serving with the Field Operations Support Team (FOST), assisting with the emergency operations effort throughout the state, and coordinating commercial resources when required for emergencies when disasters strike. In November 2012 SOCALR played a key role in the acquisition of commercial ambulances for the deployments of Ambulance Strike Teams to New Jersey and Garrett County, Maryland, after Hurricane Sandy.

This office has also been working closely with the MIEMSS Information Technology department for the implementation and management of the eMEDS[®] electronic patient care reporting system as it pertains to commercial services. Currently 24 out of the 40 commercial services are utilizing eMEDS[®] as their primary method of patient care documentation. SOCALR is actively working on a dynamic run form template for use by the commercial services which will be specific to interfacility and commercial service transports. We anticipate that using this template will increase productivity and make patient care reporting easier for users.

Earlier this year the Commercial Ambulance Service Advisory Committee (CASAC) recognized the importance and need for a special subcommittee to be established to review existing COMAR regulations that address neonatal (NEO) transports. This committee unanimously approved creation of the NEO Subcommittee, which consists of representatives from neonatal transport teams, designated perinatal centers, and esteemed colleagues with specific knowledge and background regarding neonatal transports. The NEO Subcommittee completed its review of current neonatal regulations and submitted recommendations for changes to CASAC. These recommendations were unanimously approved by CASAC and forwarded to the State EMS Board for final approval to begin the promulgation process. This process has been a major accomplishment for both CASAC and SOCALR.

MARYLAND TRAUMA & SPECIALTY REFERRAL CENTERS

Injured patients need treatment at the hospital best staffed and equipped to meet their special needs. Maryland's system of care ensures that patients promptly get to the most appropriate hospital in an effort to decrease morbidity and mortality. (For differences in standards in the levels of trauma centers, see the Trauma Center Categorization chart on page 40.) The trauma and specialty referral centers within the Maryland EMS System are:

TRAUMA CENTERS

Primary Adult Resource Center

- R Adams Cowley Shock Trauma Center/University of Maryland Medical System, Baltimore City

Level I Trauma Center

- The Johns Hopkins Hospital Adult Trauma Center, Baltimore City

Level II Trauma Centers

- Johns Hopkins Bayview Medical Center, Baltimore City
- Prince George's Hospital Center, Cheverly
- Sinai Hospital, Baltimore City
- Suburban Hospital, Bethesda

Level III Trauma Centers

- Meritus Medical Center, Hagerstown
- Peninsula Regional Medical Center, Salisbury
- Western Maryland Regional Medical Center, Cumberland

SPECIALTY REFERRAL CENTERS

Burns

- Baltimore Regional Burn Center/ Johns Hopkins Bayview Medical Center, Baltimore City
- Burn Center/MedStar Washington Hospital Center, Washington, DC
- Pediatric Burn Center at Children's National Medical Center, Washington, DC
- Pediatric Burn Service at Johns Hopkins Children's Center

Cardiac Interventional Centers

- Region I
 - Western Maryland Regional Medical Center
- Region II
 - Frederick Memorial Hospital
 - Meritus Medical Center
- Region III
 - Anne Arundel Medical Center
 - Baltimore Washington Medical Center
 - Carroll Hospital Center
 - MedStar Franklin Square Hospital
 - Howard County General Hospital
 - Johns Hopkins Bayview Medical Center
 - The Johns Hopkins Hospital
 - Sinai Hospital
 - St. Agnes Hospital
 - University of Maryland, St. Joseph Medical Center
 - MedStar Union Memorial Hospital
 - University of Maryland Medical Center
 - Upper Chesapeake Medical Center
- Region IV
 - Peninsula Regional Medical Center
- Region V
 - Holy Cross Hospital
 - Prince George's Hospital Center
 - Shady Grove Adventist Hospital
 - Medstar Southern Maryland Hospital
 - Suburban Hospital
 - Washington Adventist Hospital

- Out-of-State Cardiac Interventional Centers
 - Bayhealth Medical Center, Dover, DE
 - Christiana Hospital, Newark, DE
 - MedStar Washington Hospital Center, Washington, DC
 - Nanticoke Memorial Hospital, Seaford, DE

Eye Trauma

- The Wilmer Eye Institute/The Johns Hopkins Hospital, Baltimore City

Hand/Upper Extremity Trauma

- The Curtis National Hand Center/ MedStar Union Memorial Hospital, Baltimore City

Hyperbaric Medicine

- Center for Hyperbaric Medicine/ R Adams Cowley Shock Trauma Center/University of Maryland Medical System, Baltimore City

Neurotrauma

(Head and Spinal Cord Injuries)

- Neurotrauma Center/R Adams Cowley Shock Trauma Center/University of Maryland Medical System, Baltimore City

Pediatric Trauma

- Pediatric Trauma Center/Johns Hopkins Children's Center, Baltimore City
- Pediatric Trauma Center/Children's National Medical Center, Washington, DC

Perinatal Referral Centers

- Anne Arundel Medical Center
- MedStar Franklin Square Hospital Center
- Frederick Memorial Hospital
- Greater Baltimore Medical Center
- Holy Cross Hospital
- Howard County General Hospital
- Johns Hopkins Bayview Medical Center
- The Johns Hopkins Hospital
- Mercy Medical Center
- Peninsula Regional Medical Center
- Prince George's Hospital Center
- St. Agnes Hospital
- University of Maryland, St. Joseph Medical Center

- Shady Grove Adventist Hospital
- Sinai Hospital
- University of Maryland Medical System

Poison Consultation Center

- Maryland Poison Center/University of Maryland School of Pharmacy, Baltimore City

Designated Primary Stroke Centers

- Anne Arundel Medical Center
- Atlantic General Hospital
- University of Maryland, Baltimore Washington Medical Center
- Calvert Memorial Hospital
- Civista Medical Center
- MedStar Franklin Square Hospital Center
- Frederick Memorial Hospital
- MedStar Good Samaritan Hospital
- Greater Baltimore Medical Center
- MedStar Harbor Hospital Center
- Harford Memorial Hospital
- Holy Cross Hospital
- Howard County General Hospital
- Johns Hopkins Bayview Medical Center
- The Johns Hopkins Hospital
- Memorial Hospital at Easton
- Mercy Hospital Center
- Meritus Medical Center
- MedStar Montgomery General Hospital
- Northwest Hospital
- Peninsula Regional Medical Center
- Shady Grove Adventist Hospital
- Sinai Hospital
- MedStar Southern Maryland Hospital
- St. Agnes Hospital
- University of Maryland, St. Joseph Medical Center
- MedStar St. Mary's Hospital
- Suburban Hospital
- Union Hospital of Cecil County
- MedStar Union Memorial Hospital
- University of Maryland Medical Center
- Upper Chesapeake Medical Center
- University of Maryland Medical Center Midtown Campus
- Washington Adventist Hospital
- Western Maryland Regional Medical Center

Designated Comprehensive Stroke Centers

- The Johns Hopkins Hospital

Primary Adult Resource Center

R Adams Cowley Shock Trauma Center, University of Maryland Medical System

Located in Baltimore City, the R Adams Cowley Shock Trauma Center, which serves as the State's Primary Adult Resource Center (PARC), reported receiving 6,618 trauma patients from June 2012 to May 2013, according to the Maryland State Trauma Registry. (See pages 73 to 78 for additional patient data in various categories.) Thomas M. Scalea, MD, FACS, FCCM, serves as the Physician-in-Chief for the Program in Trauma. Karen E. Doyle, MBA, MS, RN, NEA-BC, is the Vice-President of Nursing and Operations. During FY 2013 the Center had a 96% survival rate of the 8,265 patients received. In FY 2013, 87% of patients admitted to the Shock Trauma Center arrived by ground transportation and 13% arrived by air. Demographic data obtained indicate that the majority of admissions were male (67%) and aged 15 to 35 years (44%), followed by patients aged 36 to 55 (31%), and 56 or older (25%).

As the nation's first and only integrated trauma hospital, the R Adams Cowley Shock Trauma Center is dedicated to treating the critically ill and severely injured and employs groundbreaking research and

innovative medical procedures with one goal in mind—saving lives. As one of the highest volume trauma centers in the United States, teams of providers are standing by 24/7 to receive, resuscitate, stabilize, and treat those whose lives are threatened by time-sensitive injury and illness. These include, but are not limited to, thoracic, intra-abdominal, and facial trauma; spinal cord and column injuries; brain injury; and acute complex orthopaedic injury. In addition, patients who develop life-threatening respiratory failure, multiple organ dysfunction, soft tissue infection, and sepsis may be transferred to the Trauma Center where expert clinicians and sophisticated technology such as advanced hemodynamic monitoring, continuous renal replacement therapy, and extracorporeal membrane oxygenation are readily available.

The Shock Trauma Center is a multidisciplinary clinical, educational, and research institution dedicated to world class standards in the prevention and management of critical injury and illness. The Trauma Center's highly specialized medical personnel and dedicated resources are focused on a single mission: To eradicate preventable death and disability and thus reduce the personal tragedy and overall costs associated with severe injury. This mission is continuously pursued through state-of-the-art clinical care services, active research, didactic and hands-on clinical education, and prevention programs.

Trauma Center Categorization

Differences in Standards Based on Physician Availability and Dedicated Resources	PARC	Level I	Level II	Level III
Attending surgeon who is fellowship-trained and is in the hospital at all times	X			
Dedicated facilities (Resuscitation Unit, Operating Room, and Intensive Care Unit) 24 hours	X			
Facilities (Resuscitation Unit, Operating Room, and Intensive Care Unit) available at all times	X	X	X	X
Trauma Surgeon available in the hospital at all times		X	X	
On-call Trauma Surgeon available within 30 minutes of call				X
Anesthesiologist in the hospital at all times and dedicated to trauma care	X			
Anesthesiologist in the hospital at all times but shared with other services		X	X	
On-call Anesthesiologist with CRNA who is in the hospital				X
Orthopedic Surgeon in the hospital at all times and dedicated to trauma care	X			
Orthopedic Surgeon in the hospital at all times but shared with other services		X		
On-call Orthopedic Surgeon available within 30 minutes of call			X	X
Neurosurgeon in the hospital at all times and dedicated to trauma care	X			
Neurosurgeon in the hospital at all times but shared with other services		X		
On-call Neurosurgeon available within 30 minutes of call			X	X
Fellowship-trained/board-certified surgical director of the Intensive Care Unit	X	X		
Physician with privileges in critical care on duty in the Intensive Care Unit 24 hrs/day	X	X	X	
Comprehensive Trauma Research Program	X	X		
Education—Fellowship Training in Trauma	X			
Surgical Residency Program	X	X		
Outreach Professional Education	X	X	X	

The Trauma Center's physical plant covers 200,000 square feet and is undergoing expansion for an additional 140,000 square feet. The Trauma Center is designed to ensure immediate diagnostic and therapeutic access for the critically injured and ill patient population. Key features include:

- A dedicated, highly trained, and experienced multidisciplinary clinical staff
- A rooftop helipad capable of handling up to three medevac helicopters simultaneously and a dedicated ground entrance for ambulances
- A dedicated trauma resuscitation unit with 13 resuscitation/stabilization bays
- 9 state-of-the-art operating rooms, 16 post-anesthesia recovery beds, 24 critical care/intensive care beds, 18 acute care beds, and an additional 12 critical care beds and 12 intermediate care beds located in the Neurotrauma Center.
- 24 intermediate care beds with the capacity for additional beds on an as-needed basis in the adjacent University of Maryland Medical Center
- Comprehensive radiology service and the Mirmiran Foundation Diagnostic Imaging Suite with two dedicated high-speed computed tomography (CT) scanners (one 40 and one 64 slice), and a dedicated trauma angiography suite, all accessible on a 24-hour basis
- A 24-hour STAT lab
- Sophisticated technological monitoring and clinical computer capability at the bedside
- A multi-patient hyperbaric chamber with a capability of handling 23 seated patients
- A trauma and specialty care ambulatory center with 14 exam rooms
- Respiratory, physical, occupational, and speech therapy services, case management, pain management, integrative medicine, nutritional services, social work and pastoral care staff, a designated patient advocate, and a substance abuse program
- Trauma Survivors Network
- Center for Injury Prevention and Policy

Shock Trauma continues to be the nation's premier trauma center, advancing care and developing new life-saving techniques. It also serves as a referral center for Maryland in neurotrauma and hyperbaric medicine (www.umm.edu/programs/shock-trauma).

GO-TEAM

The Trauma Center maintains an advanced resuscitative team capable of responding to the scene of seriously injured patients. This physician-led team complements Maryland's Statewide EMS System by providing critical care and surgical services that are

typically considered beyond the scope of prehospital emergency care providers.

Scene incident commanders may request a GO-TEAM response for patients with suspected life-threatening injuries when extrication times are estimated to exceed one hour. In situations where preliminary reports suggest that a victim's condition may require the GO-TEAM, but the extent of the rescue operation is unknown, a request can be made to put the team on alert. The purpose of the alert status is to reduce the team's eventual response time. In this circumstance, the team would be assembled but not dispatched until an initial on-scene assessment determines that the team is needed.

When dispatched, the GO-TEAM serves as a specialized component of Maryland's statewide emergency medical system. The Shock Trauma GO-TEAM is comprised of an attending physician (anesthesiologist, surgeon, or critical care medicine specialist) and a certified registered nurse anesthetist. Team members undergo a core training curriculum that includes field surgical care, State EMS protocols, scene safety, helicopter safety, hazardous materials awareness, radio communications, incident command, vehicular rescue, emergency vehicle operations, and field operations.

The GO-TEAM works closely with on-scene emergency medical and rescue personnel to provide patient care. A detailed list of the capabilities of the GO-TEAM is available at www.umm.edu/programs/shock-trauma/professionals/ems/go-team.

The Trauma Center is also available to develop individualized disaster or tactical response plans for regional EMS agencies or jurisdictions having specialized medical or rescue needs.

Training

Training is central to the mission of the R Adams Cowley Shock Trauma Center. The Fellowship programs are considered among the best in the world. Currently, the Trauma Center offers fellowships in the following specialties: Surgical Critical Care – 8 positions; Anesthesiology – 2 positions; Orthopaedic Surgery – 5 positions; Emergency Medicine – 4 positions; and Acute Care – 1 position.

The Surgical Critical Care (SCC) Fellowship Program at the R Adams Cowley Shock Trauma Center, University of Maryland is the largest Accreditation Council for Graduate Medical Education (ACGME) accredited SCC training program in the country, finishing eight Fellows annually, as well as Acute Care Emergency Surgery and Emergency Critical Care Fellows. This specialty has experienced a national surge in the number of applicants over the past five years, and the number of filled positions has doubled (from 66 to 132). In 2008 the Fellowship Class

represented 12% of all SCC trainees, and approximately 6% of new SCC physicians released into the workforce are “Shock Trauma” trained. While there are now more than 100 SCC programs listed, the R Adams Cowley Shock Trauma Program remains at the forefront, as it has matched the top eight ranked Fellow candidates for the second consecutive year.

The University of Maryland Orthopaedic Traumatology Fellowship is considered by many to be the foremost orthopaedic trauma fellowship worldwide. Alumni of the fellowship currently lead trauma care and orthopaedic education at numerous centers nationally and internationally. The program is ACGME accredited. The primary goal of the University of Maryland Orthopaedic Traumatology Fellowship is to educate orthopaedic surgeons to become clinically proficient in managing the musculoskeletal injuries of the severely or multiply injured patient in an interdisciplinary environment. Additional goals include educating Fellows in the associated research and teaching skills to become leaders in the field of orthopaedic traumatology.

The Shock Trauma Center remains the American College of Surgeons’ (ACS’) designated training site for both students and course instructors for the State of Maryland. Throughout the calendar year, a core of both critical care and surgical skills training courses are offered to providers throughout Maryland, the country, and the world. A strong collaboration has been forged with the University of Maryland, School of Medicine in offering advanced training in critical care and trauma care to medical students.

The ACS Advanced Trauma Life Support (ATLS) Course and the Society of Trauma Nurses Advanced Trauma Care in Nursing (ATCN) Course, along with the Society of Critical Care Medicine’s Fundamental Critical Care Support Course continue to be the cornerstone courses of the curriculum. Surgical skills courses are offered throughout the calendar year, including Advanced Trauma Operative Management (ATOM) and Advanced Surgical Skills for Exposure in Trauma (ASSET). Disaster Management and Emergency Preparedness courses are offered on a regular basis to all partners in patient care from first responders to advanced clinicians.

Annual events such as the Trauma Resident Paper Competition and the Trauma Care Conference serve as a forum for contemporary innovations and current subject matter and issues that impact the trauma community; these events are open to all colleagues.

Claire C. Leidy, BA, serves as the ATLS, ATOM, ASSET, and Trauma Evaluation and Management (TEAM) Program Coordinator for the Maryland Committee on Trauma.

Advanced Trauma Care in Nursing is a course designed for the registered nurse interested in increasing his or her knowledge in the management of the multiply injured patient. The ATCN course is taught concurrently with ATLS. The ATCN program has been operational for over 15 years and has an excellent record of offering a superb trauma educational program and maintaining a positive collaboration with the ACS Maryland Committee. The ATCN program is currently being offered in numerous states as well as internationally. The R Adams Cowley Shock Trauma Center is one of the few facilities to hold monthly ATCN courses. The course is provided in collaboration with The Johns Hopkins Hospital. Claudia Handley, RN, MBA, MSN; Susan Ziegfeld, MSN, CRNP; and Elwood Conaway, BSN, CCRN, CEN, are the course directors.

Center for the Sustainment of Trauma and Readiness Skills

Since 2001 US Air Force Medical Service personnel, including surgeons, nurses, and medical technicians, have traveled to Baltimore for training at the US Air Force Center for the Sustainment of Trauma and Readiness Skills (C-STARS) embedded within the Shock Trauma Center. This location is one of three C-STARS sites in the country, each specifically chosen for trauma patient volume, mechanisms of injury, and clinical expertise. These civilian-military partnerships are crucial in keeping military medics constantly ready for wartime casualty care. C-STARS provides military personnel with a real-world platform for intense, state-of-the-art training in trauma skills for the care of the critically injured soldier. This relationship is mutually beneficial as the Trauma Center team learns skills and maintenance techniques and identifies patient throughput strategies that improve the delivery of definitive care to patients. This relationship further creates an environment conducive to collaborative research supported by the US Department of Defense to benefit all trauma patients, both military and civilian. The number of C-STARS trainees at the Trauma Center in FY 2013 was 294.

Shock Trauma and Anesthesiology Research-Organized Research Center

The Charles “McC” Mathias, Jr., National Study Center for Trauma and Emergency Medical Systems (NSC) is now part of an Organized Research Center (ORC) designed to further basic, translational, and clinical studies in injury research. The Shock, Trauma, and Anesthesiology Research (STAR) ORC is a world-class, multidisciplinary research and educational center focusing on brain injuries, critical care and organ sup-

port, resuscitation, surgical outcomes, patient safety, and injury prevention. It is the first research center in the nation dedicated exclusively to the study of trauma and its complications and prevention. STAR encompasses the research activities of the University of Maryland School of Medicine's Program in Trauma and Department of Anesthesiology, along with the existing NSC, which was established in 1986 by the US Congress. In 2012-2013, the annual extramural funding generated by STAR was over \$13 million.

The efforts of the STAR-ORC are focused on clinical research trials on prospective and retrospective studies of resuscitation and treatment of the injured, especially victims of neurotrauma; the Crash Injury Research and Engineering Network (CIREN), which focuses on automotive safety and design based on in-depth engineering analysis of automotive crashes; serving as a test bed for emerging technologies such as telemedicine initiatives and military field-testing of resuscitation and other clinical technology; an integrated pre-clinical translational research program focusing on central nervous system injuries; and collaboration with the military through its C-STARS program based at the Shock Trauma Center.

As part of STAR's portfolio, the research program at the Trauma Center is an integrated multidisciplinary program that seeks to answer important questions concerning issues affecting trauma patients. R Adams Cowley Shock Trauma Center researchers participate in large national and international multi-institutional projects, and they conduct projects funded by the National Institutes of Health, the US Department of Defense, and various industry sponsors. The US Air Force is currently a major sponsor of research at STAR with 15 projects funded for over \$9.4 million, 13 of which are still active. Clinical projects conducted at the Trauma Center funded by the US Air Force included the construction of a state-of-the-art simulation center, a study of continuous noninvasive monitoring, the development of predictive triage indices for outcome following trauma, and predicting blood product needs using prehospital vital signs. Overall, there were six newly-funded projects at STAR in 2012-2013, three of which are actively involving patients at the Shock Trauma Center. For additional information pertaining to research at the Shock Trauma Center, refer to the section on The National Study Center for Trauma and EMS (page 90 to 92).

Pragmatic, Randomized Optimal Platelet and Plasma Ratios Study

The objective of the Pragmatic, Randomized Optimal Platelet and Plasma Ratios (PROPPR) study is to conduct a Phase III multi-site, randomized trial in subjects predicted to have a massive transfusion,

comparing the efficacy and safety of 1:1:1 transfusion ratios of plasma and platelets to red blood cells (the closest approximation to reconstituted whole blood) with the 1:1:2 ratio. The study is being conducted at 12 Level I Trauma Centers across North America. The PROPPR study, funded by the National Heart, Lung, and Blood Institute and US Department of Defense, is currently underway at the Trauma Center.

Membership in Regional and National Organizations and Leadership Roles

Many of the faculty and staff at the R Adams Cowley Shock Trauma Center are members of and/or hold leadership positions in national, regional, and state organizations.

Dr. Thomas Scalea holds positions on the Membership Committee, Program Committee, Scholarship and Awards Committee, Ad Hoc Emergency Surgery Committee, and is a Member-at-Large for the Board of Managers of the American Association for the Surgery of Trauma (AAST). Dr. Deborah Stein has a role in the Ad Hoc Acute Care Surgery Committee for the Eastern Association for the Surgery of Trauma (EAST) and the Ad Hoc Geriatric Trauma Committee for AAST. Dr. Romney Anderson is the Chair of the Military Committee for the Orthopaedic Trauma Association. Dr. William Chiu is a member of the Board of Directors for EAST as well as Chairman for the Careers in Trauma Committee and Ex Officio for the Program Committee. Dr. Jose Diaz is on the Ad Hoc Acute Care Surgery Committee for EAST. Dr. Raymond Fang is the Vice-Chair of the Military Liaison Committee for EAST. Dr. Matthew Lissauer is on the Ad Hoc Acute Care Surgery Committee for EAST. Dr. Andrew Pollak is the immediate Past President of the Orthopaedic Trauma Association. Dr. Robert O'Toole is the Co-Chair of the Program Committee for the Orthopaedic Trauma Association. Dr. Carlos Rodriguez is a member of the Military Committee for EAST.

Karen Doyle, RN, serves as the President for the Society of Trauma Nurses (STN) and is a member of the State Emergency Medical Services Advisory Council. Karen McQuillan, MS, RN, CSN-BC, CCRN, CNRN, FAAN, serves on the American Association of Critical Care Nurses (AACN) Board of Directors and the AACN Certification Corporation. Tara Reed Carlson, MS, RN, is the Vice-Chair for the Maryland Trauma Center Network (TraumaNet). Karen Memphis, RN, is a Board Member of the Brain Injury Association of Maryland. Julia Pittas, PT, is a member of the Provider Council for the Brain Injury Association of Maryland.

Global Outreach

Because of the large number of trauma patients with a variety of injuries treated each year, a wealth of clinical and research experience has been accumulated at the Shock Trauma Center. Staff expertise is shared with other healthcare providers through numerous presentations at regional, national, and international professional meetings and publications in peer-reviewed journals and books. Shock Trauma Center staff is also frequently called upon as consultants to develop or improve trauma centers and systems in the United States and around the world.

The global outreach/trauma observation program initiative provides healthcare professionals with an opportunity to advance their knowledge and skills under the tutelage of world-renowned leaders in trauma and critical care medicine. The goal of this program is to provide observers, both national and international, with a current understanding of the many areas of trauma and trauma systems and, more specifically, their particular area of interest through clinical interactions, meetings and lectures, rounds, and observation of operational procedures. Past program participants have included pre-med students, military medics, nurses, high school trainers, nurse practitioners, physicians, and surgeons. In FY 2013 the Trauma Observation Program hosted 130 individuals from the United States and 26 other countries.

Additionally, the Shock Trauma team has provided on-the-ground healthcare and consulting services in Haiti, China, India, Italy, and Brazil.

EMS Outreach

The Shock Trauma Center has an active prehospital outreach program, which includes both in-hospital and out-of-hospital training for prehospital providers. The Emergency Medical Services (EMS) Office offers prehospital providers throughout the state (at an individual's request or through organized educational or agency programs) the opportunity to accompany a trauma nurse for eight hours in two different clinical settings: the Trauma Resuscitation Unit and the Critical Care Unit. This program is available 12 months a year. The primary objective is to give prehospital providers a better understanding of the relationship between prehospital procedures and definitive treatment in the hospital.

With the collaboration of the Anesthesiology Division, Maryland State Police Aviation Command, EMS educators from across the state, and the EMS Office, the Shock Trauma Center offers an all-day Advanced Life Support (ALS) airway training program with Rapid Sequence Intubation training. This educational opportunity is coordinated through the EMS Office and provides both didactic and hands-on train-

ing. Airway management is taught in the classroom setting and through a cadaver lab supervised by Shock Trauma clinical staff and educators.

The EMS Office staff offers ongoing educational opportunities for prehospital providers. In 2012-2013, evening educational programs open to prehospital and hospital care providers were held seven times and could be linked via live broadcasts to 14 remote sites across the state. Tours were given to 33 groups of EMS providers. An ALS Advanced Airway Cadaver Skills course trained 176 EMS providers in 14 labs. The Observation Program provided experiences for 186 EMS providers in the Trauma Resuscitation Unit and 134 EMS providers in the Critical Care Unit. Twenty-three onsite clinical educational programs were held at firehouses, training academies, and regional EMS conferences. In addition to the local and regional EMS conferences, the Trauma Center continued its collaboration with the *Journal of EMS* (JEMS) to provide speakers, courses, observations, and tours for "EMS Today," a national and international conference.

The EMS Office attends many fire department open houses, providing hundreds of Marylanders with EMS and prevention education materials.

Center for Injury Prevention and Policy

In a proactive effort to combat preventable injury, the Center for Injury Prevention and Policy (CIPP), led by Mayur Narayan, MD, MPH, MBA, and Tara Carlson, MS, RN, was established in 2011. The Center was created to research, evaluate, and implement trauma prevention programs on a community, regional, and national level. The established mission of the CIPP is: To reduce preventable injuries and violence and to reduce the consequences while establishing a culture of injury prevention in Maryland. CIPP initiatives use high school forums in trauma education, with the primary focus on impaired and distracted driving. The high school trauma prevention programs are specifically tailored to address teens and young adults to reduce the preventable injuries that affect them. This initiative is part of a defined partnership with the community-at-large; public and private school systems; state, local, and county legislators; National Highway Traffic Safety Administration; the NSC; and private businesses to keep all citizens safe from preventable injury.

As an adult trauma center, the R Adams Cowley Shock Trauma Center primarily focuses on trauma prevention for individuals over the age of 14. The University of Maryland Children's Hospital is the lead agency for Safe Kids Baltimore, a coalition dedicated to the prevention of unintentional childhood injuries and deaths for the children of Baltimore age 14 and under. Its primary focus areas and programs are based on morbidity and mortality data. Educational programs

include the prevention of fire, pedestrian safety, and child passenger safety.

The Center for Injury Prevention and Policy offers multiple prevention programs (bit.ly/TPP-UMMC). A detailed look at these programs follows.

Violence Prevention Program

The Violence Intervention Program

The Violence Intervention Program (VIP), led by Carnell Cooper, MD, identifies patients who are victims of personal violence in an effort to intervene and disrupt the cycle of violence. The program utilizes a multidisciplinary approach employing social workers, caseworkers, nurses, physicians, and pastoral care, along with staff from parole and probation, to provide resources and services to these patients. It is one of the few hospital-initiated violence intervention programs in the country, with compelling data to support its effectiveness. Goals of the program are to interrupt the cycle of violence, teach non-violent coping strategies, connect clients to community providers, reduce risk-taking behavior, reduce criminal behavior, and prevent further injury from violence and criminal activity. The VIP has been sustained over the past 15 years through partnerships with the Baltimore City Police Department, the Mayor's Task Force on Community Collaboration to Overcome Violence, the Baltimore Health Commissioner, and the Governor's Office on Crime Control and Prevention. Showing a strong commitment to the community, the program engaged 276 individuals in the past year.

Promoting Healthy Alternatives for Teens

Promoting Healthy Alternatives for Teens (PHAT) currently operates as a single session after a school/weekend program that incorporates tours of the Shock Trauma Center, University of Maryland, testimonials of victims and perpetrators of violence, and creative self-expression through spoken word poetry, theater, and role-playing exercises. The program is designed to expose at-risk youth to the positive and negative consequences associated with decision-making. PHAT programs are interactive in nature as the youth are introduced to a variety of hospital staff and are encouraged to ask them about their respective professions. The program encourages participant to think about their futures, set goals, and identify healthy outlets for managing their feelings.

Domestic Violence Task Force

The Domestic Violence Task Force is a coordinated effort to educate the healthcare community about domestic violence. A multidisciplinary, comprehensive approach is used to address this serious problem through two objectives: 1) education through in-service

training for the Shock Trauma nursing personnel on the screening process for domestic violence patients and 2) community outreach achieved by hosting an annual domestic violence educational event during Domestic Violence Awareness Month in October. CIPP team members participate in the Baltimore City Criminal Justice Coordinating Council on Domestic Violence and the Maryland Network Against Domestic Violence.

Trauma Prevention Program

The Trauma Prevention Program visits high schools throughout Maryland to hold assemblies focusing on impaired and/or distracted driving. The assembly opens with a slide presentation about the Shock Trauma Center. Students then watch one of three video presentations produced by the CIPP team at Shock Trauma. "Get the Message" addresses distracted driving, specifically illustrating the fatal impact of a single text message on a young driver and her friends. "Someone Like You" emphasizes the very real possibility of being a victim in an impaired driving collision. "Sean" deals with a 17-year old high school student who suffered severe brain trauma and eventually death after driving while impaired. Following the video, a team of nurses engages students in a discussion around smart decision-making. Students learn the consequences of impaired and distracted driving, along with alternatives to dangerous decision making. The program is augmented by a young trauma survivor who shares his or her powerful and inspirational story. Finally, the floor is opened to students' questions and comments about trauma prevention, impaired driving, and distracted driving. In FY 2013 the CIPP visited 80 schools and 17,784 high school students were impacted by prevention messages.

The CIPP has spread the message of the dangers of distracted driving to teens and young adults with the help of the Maryland Motor Vehicle Administration (MVA) Driver's Education Programs. In accordance with MVA requirements, all new drivers must complete a driver's education course consisting of a minimum of 30 hours of classroom instruction and 6 hours behind-the-wheel training. In the classroom instruction, students learn the basics of driving, covering everything from vehicle operation and traffic signs and signals to traffic laws and traffic safety.

When teaching students how to safely operate a vehicle, driver education instructors dedicate a portion of the curriculum to teach students the dangers of distracted driving. This portion of the class is augmented by CIPP's "Get the Message" video. In the fall of 2012, it became mandatory that the "Get the Message" video be part of a distracted driving curriculum and shown to all new drivers in Maryland, which dem-

onstrates how CIPP is helping to drive public health policy in Maryland.

Saving Maryland's At Risk Teens

The Saving Maryland's At Risk Teens (SMART) program began in 1979 and has been expanding since. The target population for this program is high school participants with dangerous behaviors related to drug and/or alcohol abuse.

The program consists of a partnership with seven counties and Baltimore City and works in coordination with the Department of Juvenile Justice Services, Family Court, the States Attorney's Office, and the Office of Substance Abuse. In FY 2013 more than 400 teens attended the weekly two-hour program.

Adult Court-Ordered Drinking Driving Monitoring Program

Adults charged with a DUI/DWI are referred to the Trauma Center for an educational experience as part of the Drinking Driving Monitoring Program (DDMP). Participants discuss poor decisions and the consequences they faced. The curriculum also reviews skills to make better decisions going forward. The two-hour program is offered once a month. In FY 2013 approximately 548 adults were served by the program.

Minds of the Future Program

The Minds of the Future Program at the R Adams Cowley Shock Trauma Center is a three-hour educational session designed to meet the needs of junior and senior high school students interested in a healthcare career. The program introduces students to various careers in the hospital setting with both didactic and hands-on approaches. Specifically, it includes presentations from a physician, nurse, and rehabilitation therapist, a tour of the hospital, and hands-on experiences in the simulation laboratory. In addition students participate in breakout sessions with some of the following groups: Rehabilitation Services, Trauma Prevention Programs, and the Maryland Advanced Simulation, Training, Research and Innovation Center (MASTRI). In FY 2013 the program presented eight courses serving 250 high school students.

Trauma Survivors Network

The Trauma Survivors Network (TSN) is a unique program started in collaboration with the American Trauma Society. This program offers an opportunity for former and current trauma patients and their families to connect with one another and rebuild their lives after a serious injury. The program incorporates peer visits, a weekly family support group, and a monthly trauma survivor's support group.

The R Adams Cowley Shock Trauma Center is committed to providing programs and resources to trauma patients and their families to manage their recovery and improve their lives.

To date, the TSN has over 20 trained volunteers who have visited over 100 patients. Monthly support group meetings attended by 15 to 20 survivors are also held; 231 trauma survivors participated in these meetings this year.

Level I

The Johns Hopkins Hospital, Adult Trauma Center

Located in Baltimore City, The Johns Hopkins Hospital Adult Trauma Center reported receiving 2,113 trauma patients from June 2012 to May 2013, according to the Maryland State Trauma Registry. (See pages 73 to 78 for additional patient data.) David T. Efron, MD, FACS, serves as Director of Adult Trauma and Chief of Acute Care Surgery and Kathy Noll, MSN, is the Trauma Program Manager. Elliott R. Haut, MD; Adil H. Haider, MD, MPH; Kent A. Stevens, MD, MPH; Albert Chi, MD; and Catherine Velopoulos, MD, MHS, are the division's full-time trauma surgeons. Marcie Feinman, MD, and Rob Leeper, MD, are the Trauma/Acute Care Surgery Clinical Fellows. Two full-time nurse practitioners, Patricia Freeman, CRNP, and Suzette Heptinstall, CRNP, further enhance the continuum of care.

After a one year hiatus, The Johns Hopkins Hospital reclaimed its ranking as the "#1 Hospital in the Nation" according to *U.S. News & World Report*. With the opening of its new patient towers on May 1, 2012, the Sheikh Zayed Adult Tower provides expanded trauma capabilities that include 6 state-of-the-art trauma rooms, a radiology suite with CT, MRI, and ultrasound, 96 intensive care beds, and 33 new operating rooms. This brand new facility has brought our capability to care for the injured patient to new heights.

The Johns Hopkins Hospital Adult Trauma Center continues to provide 24/7 in-house trauma-attending surgeon coverage. A core group of seven trauma/surgical intensivists maintain responsibility for clinical pathways and processes of care. Improved survival, triage time, and length of stay among critically injured patients have been documented with this approach.

True to the mission of Johns Hopkins School of Medicine, the Trauma Division is dedicated to research that will improve access to care and outcomes for trauma patients. The Trauma Division maintains a unique relationship with Johns Hopkins Bloomberg School of Public Health, encompassing all facets of ongoing research. In addition to its standing interest in violence

and injury prevention, the Division has broadened its academic focus to identify ethnic and gender disparities in outcomes among critically injured patients. Specific faculty interests include deep vein thrombosis prevention; benchmarking of population-based outcomes related to trauma care; quality of care studies; violence and injury prevention, both domestically and internationally; and implementation and improvement of trauma care in the developing world.

One of the most exciting projects is being spearheaded by Dr. Albert Chi, who is currently working with the Johns Hopkins University Applied Physics Lab (JHU/APL), Walter Reed Army Medical Center, and the Washington, DC, National Rehabilitation Hospital to evaluate the performance, usability, and patient/clinician acceptance of the JHU/APL Modular Prosthetic Limb (MPL) in patients who have undergone targeted muscle reinnervation surgery.

Targeted muscle reinnervation (TMR) is a new surgical procedure that reassigns nerves that once controlled the arm and the hand. By reassigning existing nerves, it is possible for people who have had upper-arm amputations to control their prosthetic devices by merely thinking about the action they want to perform. Dr. Chi has dedicated his research efforts to advancing this new surgical technique.

Developed through funding provided by the Defense Advanced Research Projects Agency, the MPL supports intuitive, non-invasive control schemes for commanding up to 17 independent joints in a robotic prosthetic arm. The MPL arm includes 3 degrees of freedom (DOF) in the wrist, 10 DOF in the hand, and 4 DOF in the upper arm. It is modular in both its physical and control configurations, accommodating the full range of amputation levels from wrist to shoulder. Currently Dr. Chi is working with the JHU/APL to design control schemes that will be derived from advanced electromyography-based pattern recognition algorithms designed for patients after TMR.

The burden of injury and injury prevention in the developing world has been the research focus of Dr. Kent Stevens. As the Associate Director for Clinical Services and Trauma Care in the International Injury Research Unit (IIRU) at the Johns Hopkins Bloomberg School of Public Health, Dr. Stevens oversees the ongoing efforts to define, prevent, and treat injury in the developing world. In collaboration with the World Health Organization (WHO), Dr. Stevens participates in the Bloomberg Philanthropies Global Road Safety Program to help reduce injury and death associated with road traffic injuries in ten low- to middle-income countries. As part of the program, Dr. Stevens works in Kenya to improve the care of the injured patient both in prehospital and hospital settings. Additional projects include trauma registry development in India and South

Africa and participation in the WHO Global Alliance for Care of the Injured as an IIRU representative.

Racial disparities in health care is a widely debated topic. As Director of the Center for Surgery Trials and Outcomes Research at Johns Hopkins School of Medicine, Dr. Adil Haider has received national attention for his research into understanding the mechanisms that lead to disparities in trauma outcomes. Dr. Haider was recently funded by the National Institutes of Health for a four-year Mentored Patient Orientated Research Career Development Award.

Dr. Elliott R. Haut has recently been awarded a highly competitive contract from the congressionally-funded Patient Centered Outcomes Research Institute (PCORI) for a study entitled "Preventing Venous Thromboembolism: Empowering Patients and Enabling Patient-Centered Care via Health Information Technology." His group will study methods to engage patients in efforts to improve prevention of venous thromboembolism (VTE) after trauma, surgery, and during medical admissions (<http://bit.ly/PCORI-VTE>). Dr. Haut leads the multidisciplinary VTE collaborative within the Armstrong Institute for Patient Safety and Quality at Johns Hopkins School of Medicine. He has published multiple articles related to his work on public reporting and prevention of deep vein thrombosis in trauma and other patient populations.

Dr. Catherine Velopulos joined the faculty in July 2013 after having completed a year as the Trauma/Acute Care Surgery Research Fellow and simultaneously earning a Master's Degree in the Graduate Training Program in Clinical Investigation at Johns Hopkins Bloomberg School of Public Health. She is currently completing coursework for an additional Certificate in Health Finance and Management. With this training in developing clinical outcomes research, Dr. Velopulos plans to focus on addressing violence recidivism through programs to build identity and self-efficacy. She is also interested in cost-effectiveness and outcomes research aimed at improving surgical care delivery and serves as a member of the Eastern Association for the Surgery of Trauma (EAST) Guidelines Committee.

Members of the trauma center faculty aspire to advance the science of trauma care education throughout the country. Dr. Haut is a member of the Board of Directors of the EAST, the premier organization publishing guidelines of trauma care, serving as the chair of the Guidelines Committee. These guidelines are freely available to all interested in trauma care at www.east.org, a website garnering over 5,000 hits monthly. Dr. David Efron currently serves as the Vice Chair of the Maryland Committee on Trauma of the American College of Surgeons. He is a Course Director for Advanced Trauma Life Support, Advanced Trauma

Operative Management, and Advanced Surgical Skills for Exposure in Trauma, and the Rural Trauma Team Course, all of which are from the curricula of the American College of Surgeons Committee on Trauma. These courses are taught in conjunction with the faculty at the University of Maryland.

Community outreach and prevention efforts at The Johns Hopkins Hospital have supported the development of an Alcohol Screening and Brief Intervention (ASBI) program. The relevance of ASBI in trauma centers was originally identified by Gentilello, et al. (1999) in *Annals of Surgery*¹ who published that 50% of trauma patients screen positive for alcohol use and ASBI is an effective means to decrease trauma recidivism. In 2005 the American College of Surgeons mandated inclusion of ASBI in trauma centers. The ASBI program for the Adult Trauma Service, although not currently mandated by the State of Maryland, provides a professional staff member who interviews and educates patients using personalized information to identify the need for ongoing resources and/or additional counseling. The program has been highlighted as a part of the curriculum of Johns Hopkins Bloomberg School of Public Health's Summer Institute on Injury Prevention. Additionally, a hospital-wide, multidisciplinary group that includes the Adult Trauma Service is developing an alcohol withdrawal syndrome protocol to be piloted in three intermediate and intensive care units.

The Johns Hopkins Hospital launched its Safe Streets Hospital Initiative on August 1, 2009. Since that time, the Adult Trauma Service, in collaboration with the Baltimore City Health Department and the Departments of Social Work, Pastoral Care, and Emergency Medicine, has worked to formalize this initiative aimed at reducing shootings and homicides within the East Baltimore community. Safe Streets utilizes conflict mediation, outreach, and community mobilization as its core elements to target high-risk individuals. Hospital Safe Streets responders are notified when a shooting victim arrives in the emergency department and respond to the hospital within 30 minutes to discuss alternatives to retaliation with the patient and family. The program is based on the successful Chicago "Cease-Fire" program and has been receiving ongoing evaluation by Johns Hopkins Bloomberg School of Public Health.

Partnership for a Safer Maryland continued to enjoy the leadership of Marla Johnston, MSN, on the Steering Committee and Dr. Haider as a member of the Advisory Board. In 2011 the Partnership awarded one of its annual injury prevention awards to The Johns Hopkins Hospital's ASBI Program.

Dr. Efron serves as the Chair of the Maryland Trauma Center Network (TraumaNet) and Kathy Noll serves as the Treasurer. Ms. Noll also serves as the Chair of the Maryland Trauma Registry/Education/Prevention Committee as well as the Maryland State Chair for the Society of Trauma Nurses. In FY 2013 Dr. Haut successfully sponsored an amendment to *The Maryland Medical Protocols for EMS Providers* regarding transport of penetrating trauma patients without spinal immobilization.

Level II

Johns Hopkins Bayview Medical Center Trauma Center

Located in Baltimore City, the Trauma Center at Johns Hopkins Bayview Medical Center entered 1,491 trauma patients into the Maryland State Trauma Registry from June 2012 to May 2013 (See pages 73 to 78 for additional patient data.) Nathaniel McQuay Jr, MD, FACS, is the clinical medical director for the trauma service and co-director of surgical critical care. Erin Lawrence, RN, is the interim program coordinator working with the two trauma registrars, a database analyst, and outreach educator to ensure the program continues to run smoothly. The trauma center continued to grow these past two years with the addition of Dr. Diane Schwartz, MD, to its faculty. Dr. Schwartz completed her trauma/critical fellowship training at the Memorial Hermann-Texas Medical Center, Houston.

The Trauma Center at Johns Hopkins Bayview Medical Center (JHBMC) is designated by MIEMSS as a Level II adult trauma center. It serves the citizens of eastern Baltimore City, eastern Baltimore County, and southern Harford County. The Trauma Center is committed to providing access to emergency surgical care for acutely injured patients with time-sensitive injuries.

The Trauma Center at JHBMC provides patient-centered comprehensive care to all trauma patients utilizing a team-oriented, multidisciplinary approach. Under the collaborative leadership of specialized physicians, nurses, and members of the healthcare team, the trauma program continues to advance with implementation of protocols to address patient and institutional needs. An example is the updated trauma diversion policy. Because of this policy, the Trauma Center remains open to receive patients an average of 98% of available hours each month, which ranks among the top Level II trauma centers in Maryland.

¹Gentilello LM, Rivara FP, Donovan DM, et al. Alcohol interventions in a trauma center as a means of reducing the risk of injury recurrence. *Annals of Surgery*. 1999;230:473-480.

The JHBMC Trauma Center uses a multidisciplinary program dedicated to the management of the adult trauma patient and the community as a whole. It is through the dedicated support from the members of the anesthesia, orthopaedics, neurosurgery, and rehabilitation departments, as well as our trauma nurses and support staff, that JHBMC is able to achieve its goal: To optimize the care of the acutely injured patient through collaborative research and the application of evidence-based practices with the goal of providing high quality care for the citizens it serves.

For the past five years, the Trauma Center at JHBMC successfully submitted records to the American College of Surgeons' National Trauma Data Bank[®] (NTDB), the largest aggregation of US trauma registry data ever assembled. JHBMC's participation in the NTDB[®] is voluntary and allows the trauma program to benchmark against national norms and to participate in trauma-related research. This type of self-assessment and performance improvement is partially responsible for JHBMC's annual survival rate of 97% for the past seven years.

Johns Hopkins Bayview Medical Center continues its designation as an EMS Base Station by supporting activities to meet state requirements. Successful designation as a Base Station is a requirement for JHBMC to maintain its designation as a trauma center and burn center.

The Johns Hopkins Bayview Trauma Center realizes the importance of community outreach and trauma prevention, as well as clinical education for health care professionals and prehospital providers throughout the region. Many programs currently exist to serve the community and our fellow healthcare colleagues. Examples of these community outreach efforts include:

- EMS topics (course offered twice a year for EMS providers to obtain continuing education credits)
- On-site clinical training for EMS providers in all areas of the hospital
- Paramedic student teaching (offered twice a year)
- Annual participation in numerous statewide health and safety fairs

Level II

Prince George's Hospital Center

Located in Cheverly, Maryland, the Prince George's Hospital Center's Trauma Center continues to provide a high level of quality trauma care to the ever increasing volume of trauma patients it receives.

According to the Maryland State Trauma Registry, Prince George's Hospital Center

(PGHC) received 3,669 trauma patients from June 2012 through May 2013. (See pages 73 to 78 for additional patient data.)

Mark Arsenault, RN, MSA, is the Vice President of Dimensions Healthcare Services Emergency Services, which includes executive oversight of the hospital's Trauma Services. Carnell Cooper, MD, FACS, continues to serve as the Medical Director and Chief of Trauma Services until July 2013, when R. Sean Benoit, MD, will be assuming that position. This will enable Dr. Cooper to devote more of his energies to his other positions as Chief Medical Officer—Dimensions Healthcare and Vice President of Medical Affairs—Prince George's Hospital Center. Gabriel Ryb, MD, MPH, FACS, serves as the Assistant Medical Director. Sandra Waak, RN, CEN, is the Trauma Program Manager and Deborah Brown, RN, is the Assistant Department Manager. Data collection is supported by two Trauma Registrars. A new position was added this year, a Trauma Registry Coordinator, which is a registered nurse position that is responsible for data abstraction and performance improvement.

The Prince George's Hospital Center is the primary adult trauma center for Prince George's, Calvert, Charles, St. Mary's, and Southern Anne Arundel Counties. Parts of Montgomery and Howard Counties, as well as the eastern region of Washington, DC, are also included in its trauma care catchment area.

The Prince George's Hospital Center's (PGHC's) relationship with University of Maryland physicians continues to get stronger; another University of Maryland Medical System (UMMS) partnership began in mid-August 2012. The PGHC Emergency Department (ED) Physician Management Group successfully changed hands to the Maryland Emergency Medicine Network (MEMN), the Emergency Physician Group of the UMMS. This represented a nearly 100% change-over of Physician and mid-level providers. This change-over has added an additional ED attending and mid-level provider during peak ED volumes times. MEMN assumed leadership of the Laurel Regional Emergency Department in July 2012 and the Bowie Emergency Department in January 2013. Dr. Doug Mayo is the designated Emergency Department Director at PGHC. He also fills the role of the Dimensions Regional Medical Director, covering the three Dimensions Emergency Departments.

The UMMS orthopaedic partnership has also expanded. In November 2011 PGHC welcomed Dr. Christina Boulton. In October 2012 she was joined by

another full-time orthopaedic surgeon, Dr. Jide Tinubu. He is also fellowship-trained in Trauma Orthopaedics and is an Assistant Professor of Orthopaedic Surgery at the University of Maryland. As the Trauma Orthopaedic service grows stronger, the number of patients requiring transfer out of PGHC for management of complicated orthopaedic injuries, especially pelvis and acetabular fractures, has decreased. Drs. Boulton and Tinubu are available to consult on these cases even when they are not officially on-call; consequently, most of the complicated orthopaedic injuries that would have been referred to another facility in the past are now able to be managed at PGHC.

Prince George's Hospital Center also has a new affiliation request with the University of Maryland for the Acute Care Surgery Fellowship Program. In this program, two Trauma Fellows can each do one-month clinical fellowship rotations. Dimensions Healthcare Services Emergency Services is excited about the continued development of strong partnerships with the University of Maryland.

Our trauma volumes continue to show growth, increasing by approximately 4% since last year. This demonstrates two years of trauma growth after four years of relatively flat volumes. Overall ED volumes have remained steady. The ED trauma resuscitation bays have recently been renovated, including installing new flooring, painting walls, and replacing counters, giving the rooms a fresh, bright look. The ED has also made changes in the triage process. There is now a "staging area" for ambulance patients and a "quick look nurse." These changes have decreased the amount of time before an ED patient is seen by a nurse and has facilitated quicker ambulance off-load times.

The hospital is now moving from a paper chart to an electronic medical record (EMR). The PGHC Emergency Department was the first in the Dimensions Healthcare System to implement an EMR system, beginning February 2013. The next month, EDs in Laurel and Bowie also transitioned to an EMR system. The rest of the hospital went live to a house-wide EMR the second week of June 2013. The electronic record is more legible and provides for more streamlined reporting.

Due to dedicated efforts to keep our patients safe from hospital-acquired conditions such as infections, PGHC continues to show improvement. The Critical Care Center has instituted measures to minimize Ventilator Acquired Pneumonias, which decreased by 75% after implementing a new chlorhexidine gluconate mouth care program.

Vice President Mark Arsenault, RN, MSA, remains the Chair of the Prince George's County Emergency Preparedness Coalition and the Chair of

the Region V Health and Medical Task Force. These coalitions work with the regional hospitals, health departments, fire/EMS, and other partners in regional emergency preparedness.

We at Dimensions Healthcare System and Prince George's Hospital Center are excited about the vision and commitment of the Governor, Lt. Governor, Prince George's County Executive and County Council, and the community to superior health care in Prince George's County. Early discussions are taking place regarding the building of a new Regional Medical Center. Several potential locations are under consideration and a decision is expected to be made in fall 2013. We look forward to continued growth in our relationship with the University of Maryland Medical System and the University System of Maryland to bring comprehensive and responsive healthcare to Prince George's County.

Level II

Sinai Hospital Trauma Center

Located in Baltimore City and serving the northwest corridor of the Greater Baltimore Metropolitan area, Sinai Hospital reported receiving 1,628 trauma patients from June 2012 through May 2013, according to the Maryland State Trauma Registry. (See pages 73 to 78 for additional patient data.)

Dr. Thomas Genuit, MD, MBA, FACS, has continuously served as Trauma Director since 2003. Lauren Smith, MSN, ACNP, joined the program in December 2012 as a Trauma Nurse Coordinator. Prior to joining the Trauma Program at Sinai, Ms. Smith gained experience as a trauma nurse at the R Adams Cowley Shock Trauma Center from 2000 to 2006, and experience in surgical/trauma critical care at Sinai Hospital of Baltimore from 2006 to 2012. Ms. Smith has been an educator at the University of Maryland School of Nursing since 2006. Her special interests lie in neurotrauma and performance improvement systems.

In addition, the program has added several members to its trauma/critical care faculty. Dr. Brian Brewer completed training at the Elvis Presley Memorial Trauma Center in Memphis, Tennessee, as well as a Fellowship in Trauma and Critical Care at Emory University. Besides his clinical work, he is focusing on Trauma Peer Review and process improvement. After several years of research at the Alabama University School of Medicine and Johns Hopkins University, Dr. Lingxiang Ye completed his residency at Sinai Hospital and then a Fellowship in Trauma

and Critical Care at the R Adams Cowley Shock Trauma Center. Dr. Eric Kraut completed his residency at the Washington Hospital Center and his Trauma Fellowship at the University of California, Davis. As a final addition to the Program, the Hospital is currently in the process of hiring Dr. Hashim Hesham, an experienced trauma surgeon from the Level I Trauma Center of the University of Albany; he is expected to begin in October 2013.

Together with the faculty expansion, Trauma Director Dr. Thomas Genuit has created a cohesive division of Acute Care Surgery, Trauma, and Surgical Critical Care, as well as a separate Trauma and Acute Care Surgery service that improves the continuity of care and use of evidence-based medicine for emergency surgery, trauma, and critically ill patients at Sinai Hospital.

Over the past fiscal year, the number of trauma patients cared for by the Trauma Center at Sinai Hospital and their injury severity scores has remained relatively stable.

Quality of care is of the utmost importance to the Trauma Program at Sinai Hospital. Ongoing quality management is provided through weekly trauma case reviews by the Trauma Coordinator, Data Coordinator, and Trauma Director; monthly departmental Continuing Medical Education (category I CME-approved) Trauma Morbidity and Mortality Conferences; and the monthly faculty peer-review meetings.

The Accreditation Council for Graduate Medical Education (ACGME) approved surgical residency program is currently in its eighth year, with full accreditation. All residents and Physician Assistants/Nurse Practitioners are Advanced Trauma Life Support and Advanced Cardiovascular Life Support certified. All residents receive additional training in Advanced Trauma Operative Management, Focused Abdominal Sonography in Trauma, and an eight-week rotation at the R Adams Cowley Shock Trauma Center during their post-graduate III-V years.

The hospital continues its active participation in regional and national initiatives to improve patient care, including the Maryland Trauma Quality Improvement Council, the National Surgical Quality Improvement Program by the American College of Surgeons, and the Centers for Disease Control/Centers for Medicare and Medicaid Services National Surgical Infection Prevention Program. The Trauma Center maintains active involvement in the Maryland Trauma Center Network (TraumaNet) to advance all aspects of trauma care. Sinai and its Trauma Center place a high

value on maintaining an excellent working relationship and open communications with EMS and its providers in the Greater Baltimore Metropolitan area.

In an effort to maintain a state-of-the-art facility at Sinai Hospital, the Louis and Phyllis Friedman Neurological Rehabilitation Center was opened in October 2012. The Rehabilitation Center at Sinai has expanded its services to include traumatic brain and spine injury, acute inpatient and outpatient rehabilitation, and a comprehensive concussion evaluation and rehabilitation program. The hospital's Center for Geriatric Surgery continues to grow and future efforts will include issues specifically related to the management of trauma and critical illness in the elderly. Sinai's Emergency Department (ER-7) has also seen continued growth. To accommodate more than 85,000 patients per year, the hospital has begun a significant expansion that will include a rapid assessment unit and a short-stay observation unit. As part of this process, the Louis and Phyllis Friedman Foundation has pledged a substantial gift to renovate the trauma resuscitation areas.

Under the new leadership of Neal Meltzer, CEO of the LifeBridge Health System, and Amy Perry, President of Sinai Hospital and Executive Vice President of LifeBridge Health, the institution continues its commitment to all injured patients in the Greater Baltimore Metropolitan area.

Level II

Suburban Hospital – Johns Hopkins Medicine

Located in Bethesda, Maryland, the Suburban Hospital Trauma Center is the only designated trauma center in Montgomery County, serving the residents of Bethesda, Potomac, Kensington, Rockville, Silver Spring, Germantown, and Gaithersburg. It also provides back-up support to the trauma centers of Frederick, Washington, and Prince George's Counties.

From June 2012 through May 2013, 1,572 trauma patients were treated at Suburban, according to the Maryland State Trauma Registry. (See pages 73 to 78 for additional patient data.)

Dany Westerband, MD, FACS, is the Medical Director of Suburban Hospital's Trauma Services. Melissa Meyers, RN, BSN, MBA, is its full-time Trauma Program Director. The trauma program staff also includes trauma data analyst Cathy Pierce, BS, and two trauma nurse case reviewers, Patricia Baker, RN, and Taryn Giza, RN, BSN, CEN.

The Suburban Hospital Trauma Center continues to strive in the provision of the highest level of quality trauma care. A driving force in the quality management program at Suburban is the daily concurrent and retrospective review of trauma care. Through a careful process that involves a thorough review of all records, clinical and system issues are rapidly identified, addressed timely, and further discussed at monthly multidisciplinary and intradepartmental meetings, which often lead to the development of new policies and treatment guidelines. Furthermore, significant complications and management challenges are also brought up for discussion at monthly formal morbidity and mortality conferences, which serve as educational forums for the trauma surgeons, emergency department physicians, intensivists, surgical residents, nurse practitioners, physician assistants, registered nurses, and many other clinicians involved in trauma care. In addition, case presentations of interest are also held frequently, within and outside the trauma center, to further enhance trauma continuing education in the region.

Over the past few years, and with a significant percentage of trauma patients as older adults, Suburban has demonstrated an organization-wide commitment to provide the best medical care possible to older patients. In September 2011 the hospital earned the coveted Nurses Improving Care for Healthsystem Elders (NICHE) designation from the Harford Institute for Geriatric Nursing at New York University College of Nursing. Suburban Hospital was also one of only four hospitals in the greater Washington, DC, region to receive top ratings for inpatient care and simple and complex emergency care from Washington Consumers' CHECKBOOK in November 2012.

Suburban Hospital remains an intimate component of the Montgomery County Collaborative on Emergency Preparedness (MOCEP) and the Bethesda Hospitals' Emergency Preparedness Partnership (BHEPP), whose mission is the advancement of emergency preparedness and research for the National Capital Region. While BHEPP includes the National Institutes of Health (NIH), the National Library of Medicine, and the Walter Reed National Military Medical Center, MOCEP rallies all Montgomery County Hospitals, the Kaiser Permanente Health Plan, the Public Health Administration, Emergency Medical Services, and Homeland Security. Through these solid alliances and expanded participation in local, state, and national disaster drills, Suburban Hospital, a member of Johns Hopkins Medicine, remains one of the most "highly prepared" Trauma Centers in the nation and proudly represents MIEMSS Region V in Emergency Support Function (ESF) #8 activities for the National Capital Region. In an effort to help hospitals man-

age high volumes of incoming patients in disaster situations, the National Library of Medicine at NIH worked with Suburban Hospital to develop a Patient Tracking and Locating System that can be made available to hospitals nationwide. This system was deemed a "Secretary's Pick" as part of the US Department of Health and Human Services' *HHSinnovates* program.

Meanwhile, Suburban Hospital has kept its status as a designated ST-elevation myocardial infarction (STEMI) Center in the State of Maryland. With strong support from the Heart, Lung, and Blood Institute of the NIH and Johns Hopkins Medicine, the hospital continues to offer easy access to cardiac surgery and other advanced cardiovascular treatment. The NIH Stroke Center at Suburban Hospital is also doing very well, providing advanced care to stroke patients as a Primary Stroke Center certified by the Joint Commission and as a specialty referral center for stroke as designated by MIEMSS.

Injury prevention-related activities include yearly presentations to high school seniors enrolled in Suburban's Medical Venture's program, tours of the trauma bays to teenagers, lectures to the Girl Scouts of the USA, and the hospital's "Fall Prevention and Balance" programs organized by the Physical Medicine Department and presented at Montgomery County senior centers. These programs include trained physical therapists from Suburban Hospital who initiate fall-risk screenings and ensure community education on same-level falls by offering diverse lectures and classes to seniors on balance exercises and safety strategies.

Dany Westerband, MD, FACS, Medical Director of Trauma Services and Surgical Residency Liaison Director for Suburban Hospital, remains heavily committed to trauma education. As the current Chair of the Maryland Committee on Trauma of the American College of Surgeons (ACS), he is closely involved in the dissemination and teaching of all ACS-sponsored trauma courses, including Advanced Trauma Life Support, Advanced Trauma Operative Management, Trauma Outcome and Performance Improvement, and Advanced Surgical Skills for Exposure in Trauma, Disaster Management, and Emergency Preparedness. In addition, Dr. Westerband continues to serve on the 12-member State EMS Board, is an active member of the DC chapter of the ACS' Committee on Trauma, the American Association for the Surgery of Trauma, and the Eastern Association for the Surgery of Trauma. Melissa Meyers, RN, BSN, MBA, the Trauma Program Director, is an active Instructor of Advanced Trauma Nursing. She is also the immediate past Chair of the Maryland Trauma Center Network and a board member of the Maryland Division of the American Trauma Society. In addition, Ms. Meyers continues to serve

on the State Emergency Medical Services Advisory Council (SEMSAC), other state-level trauma committees, and is an active member of the Society of Trauma Nurses.

Both Dr. Westerband and Ms. Meyers are often invited to participate in specific EMS education programs held at county fire stations and the Montgomery County Fire and Rescue Training Academy. Suburban's emergency department is also a training site for prehospital care providers through an agreement with Montgomery County Community College and the Montgomery County Training Academy. The hospital sponsors an Emergency Medical Technician to Certified Nursing Assistant bridge program, free of charge, for prehospital care providers interested in working as Emergency Department Technicians.

In November 2012 a four-hour seminar, "Critical Issues in Trauma," was held at Suburban Hospital Trauma Center. This program, which included speakers from other academic medical centers, was offered free of charge to the Region's trauma community. The conference was attended by over 250 trauma care providers including physicians, registered nurses, physician assistants, and EMS providers.

To ensure that trauma and other vital health care services are available to the community at all times, the administration of Suburban Hospital remains fully committed to maintaining hospital diversion hours to a minimum. This is made possible through a special hospital-wide "Code C" team response that involves many top-level administrators and supervisors, nurse managers, physicians, logistics, transportation, and housekeeping support as well as multiple members of the emergency department and inpatient units. The goal is to keep Suburban doors open 24/7 while offering safe, dedicated, and high quality trauma and emergency care to all patients.

Level III

Meritus Medical Center Trauma Center

Key staff includes: Karl P. Riggle, MD, FACS, Director; Marc E. Kross, MD, PhD, FACS, Surgeon-in-Chief; Susie Burlison, RN, MSN, MBA, Trauma/EMS Manager; and Corey Thomas, LPN, Trauma Registrar. Located in Hagerstown, Maryland, the Trauma Center at Meritus Medical Center continues to provide trauma services to residents of Washington and Frederick Counties, Southern Pennsylvania, and the Eastern Panhandle of West Virginia. From June 2012 to May 2013, the center received 1,002 trauma patients, according to the Maryland State Trauma Registry. (See pages 73 to 78 for additional patient

data.) Vehicle crashes and injuries among the elderly account for the majority of trauma in the tri-state area; however, the incidence of penetrating injuries is increasing. More than 95% of the trauma patients treated at Meritus Medical Center arrived via ground EMS.

Our EMS Partners

The Trauma Center values its working relationship with EMS providers throughout the region. It serves as a clinical site for paramedic programs in Maryland by providing opportunities for prehospital education through case presentations and other educational opportunities. In addition, the Trauma Center staff regularly attends EMS jurisdictional and Region II EMS Advisory Council meetings. Recently, Meritus Medical Center's Trauma Center honored crews from Washington and Frederick Counties (Maryland) and Adams County (Pennsylvania) for outstanding EMS care.

Community Impact

The dedicated staff of Meritus Medical Center's Trauma Center continues to advocate for injury prevention throughout the community. In coordination with the Safe Kids Washington County Coalition, safety events focusing on child passenger safety, bicycle safety, and injury prevention were held at the Children's Safety Village of Washington County and in targeted neighborhoods. The Trauma Center has taken on the leadership role for Safe Kids Washington County along with car seat safety installation checks. The trauma program has also partnered with the Washington County Health Department to provide "Stepping On" classes to the elderly in Washington County to prevent falls. Each community has made an investment to ensure that it is a safe place to live, work, and visit.

Trauma Center staff actively participate in Meritus Health's annual Medical Academy for high school students interested in medical careers. Students spend a week taking part in activities that would provide care to a trauma patient including shadowing EMS teams, flight crews, and staff from various units, such as the operating room, emergency department, physical therapy, laboratory, and infection control.

Following the state and national trend, Washington County saw an increase in injuries related to distracted driving. *Stay Alive! Don't Text and Drive* was created as an injury prevention and public awareness campaign targeted at teens and their families to increase the awareness of the devastating effects of distracted driving, especially texting and driving. This campaign won an injury prevention award in June 2012 from The Partnership for a Safer Maryland, a

2012 Communicator Award, and the 2013 American Trauma Society Distinguished Service Award and continues to be supported by our EMS partners, regional businesses, public school systems, law enforcement, and community leaders.

Education and Outreach

The Trauma Center hosted two multidisciplinary trauma conferences for direct-care providers. Plans are in place to continue this semiannual event in upcoming years. Members of the Trauma Center staff, such as Dr. Marc E. Kross, Surgeon-in-Chief, have spoken on trauma-related topics to local healthcare and community groups. Dr. Kross served on the planning committee for the Maryland Committee on Trauma Symposium and was on the faculty for numerous EMS case presentations.

The W. L. Riggle Memorial Trauma Nurse Education Fund continues to provide scholarship money for trauma nursing continuing education.

Trauma Center staff celebrated Trauma Awareness Month with an art contest for Washington County elementary school students on summer safety. To further celebrate the contributions and dedication of the Trauma Center staff, the hospital held an annual Trauma Team Recognition Day and recognized a trauma nurse for providing exceptional care.

Level III

Peninsula Regional Medical Center Trauma Center

Located in Salisbury, 30 miles west of Ocean City, Peninsula Regional Medical Center (PRMC) Trauma Center is the only Trauma Center located on the Eastern Shore of Maryland. PRMC received 1,524 trauma patients from June 2012 to May 2013, according to the Maryland State Trauma Registry. (See pages 73 to 78 for additional patient data.) Brion McCutcheon, MD, serves as the Trauma Medical Director and Kari Cheezum, RN, BSN, CEN, serves as the Trauma Program Manager. Trauma Department staff also includes Tonya Craft, EMT-P, Trauma Registrar and Doug Walters, RN, EMT-I, EMS Nurse Liaison. In addition to being designated as a Level III Trauma Center, PRMC is also a Joint Commission on Accreditation of Healthcare Organizations (JCAHO)-certified Acute Myocardial Infarction (AMI) and Stroke Center, as well as a Maryland Primary Stroke Center and Cardiac Interventional Center.

The Peninsula Regional Medical Center (PRMC) Trauma Center continues to coordinate and participate in community-based injury prevention initiatives. During the homecoming and prom seasons in fall 2012 and spring 2013, Trauma Center nurses and staff assisted with mock-crash scenarios at local high schools. In addition, the nurses of PRMC continue to work together to participate in venues with the Maryland Division of the American Trauma Society, Safe Kids Lower Shore Coalition, and the Worcester, Wicomico, and Somerset Highway Advisory Committees, as well as local community wellness events. In 2012 PRMC trauma department staff joined the Ocean City Pedestrian Safety taskforce focusing on improving pedestrian safety in Worcester County, including Ocean City.

Peninsula Regional Medical Center continues to assist in planning, coordinating, and sponsoring regular educational events. A multidisciplinary group continues to coordinate and sponsor the annual "Topics in Trauma" Conference, which is in its twenty-third year. Conference topics are applicable to the daily practice of prehospital care, as well as to advanced inpatient trauma care. This annual regional conference continues to attract nurses and EMS providers from Maryland, Delaware, Pennsylvania, and Virginia.

Educational classes for EMS providers from Worcester, Wicomico, and Somerset counties continued to be provided by PRMC in FY 2013. Classes for Pediatric Education for Prehospital Providers (PEPP), Prehospital Basic Trauma Life Support (PHBTLS), Advanced Life Support (ALS) Paramedic Re-certifications/Refreshers, 12-lead EKG interpretation classes for prehospital providers, and ALS Skills are just a few of the classes offered. Peninsula Regional Medical Center continues to support Wor-Wic Community College EMS programs as a clinical site for students.

We continue to promote open communication between the Medical Center and the surrounding EMS community. Our EMS Nurse Liaison, Doug Walters, RN, EMT-I, attends EMS jurisdiction, MIEMSS Region IV EMS Advisory Council, and Quality Assurance meetings on a regular basis to offer feedback to the EMS populations we serve. The Liaison also serves on the Wor-Wic Community College EMS Council, Wicomico County Highway Safety Advisory Council, Worcester County Pedestrian Safety Council, as well as several EMS advisory councils local to the area served by PRMC.

Level III

Western Maryland Regional Medical Center

Located in Cumberland, the Trauma Center at Western Maryland Regional Medical Center received 726 patients from June 2012 to May 2013, according to the Maryland State Trauma Registry. (See pages 73 to 78 for additional patient data.) Juan Arrisueno, MD, serves as the Trauma Director; Elizabeth Wooster, RN, is the Trauma Services Program Manager; and Kathy Witt is the Trauma Services Registrar.

In FY 2013 Western Maryland Health System Regional Medical Center's Emergency Department welcomed nearly 58,600 patients through its doors, nearly 725 of who were trauma patients. In 2013 the Trauma System also welcomed Dr. Birat Dhungel as a staff Trauma/General Surgeon.

Western Maryland Health System (WMHS) is committed to providing the most comprehensive care possible to the citizens of MIEMSS Region I and surrounding areas. The system actively participates in providing community health education and prevention activities. Programs presented by Trauma Services at health fairs include injury prevention activities on issues specific to our region such as all-terrain vehicle safety, motor vehicle safety, and child passenger safety. A recent example of this community awareness on trauma is an initiative between Trauma Services and the WMHS Foundation that allows an opportunity for small groups to tour the Trauma Center. This tour is headed by the CEO or CMO of the hospital and is conducted by the Trauma Services Program Manager. At the conclusion of the tour, attendees are invited to view a video of a former patient and her family that expresses the forethought of the trauma system and the capabilities of the WMHS Trauma Center. This inside look at the Trauma Center has met with rave reviews from those attending, many of who are former trauma patients.

TraumaRoo, the American Trauma Society's mascot for childhood injury prevention programs, has made many appearances at local health fairs, parades, schools, and other venues. In addition to helping younger students, Trauma Services has partnered with other area physicians to provide screening physicals for local athletes prior to beginning play. The Trauma Services Program Manager has lectured at the Allegany College of Maryland for the college's Mini-Med School lecture series on sports-related head injuries. The lecture series is focused on providing information to the layperson and, in turn, educating the community.

Elizabeth Wooster, RN, reaches out to high school students to educate on injury prevention in the form of a lecture series entitled "Trauma Nurses Talk Tough." This lecture is presented to students in Western Maryland as well as West Virginia, Pennsylvania, and Virginia and has reached nearly 30,000 students since its inception. Ms. Wooster also provides injury prevention to the regional senior citizen population. This program, titled "Watch Your Step," has been presented to 4,312 seniors in Western Maryland, West Virginia, and Pennsylvania since January 2013.

Every year, members of Emergency Department and Trauma Services staff have volunteered to triage and treat injuries at local sporting events including the Mountain Maryland Marathon, the Rocky Gap Triathlon, and the Savage Man Triathlon held at Deep Creek Lake State Park in McHenry, Maryland.

A new partnership between law enforcement, EMS, and the hospital provides educational lectures for citizens and other stakeholders in the community on the growing problem of "bath salts" and synthetic marijuana, which are used as recreational drugs. Many of the victims of this expanding problem have been evaluated by the trauma team. Several Trauma Services members have served on the expert panels, moderated by George Garrow, MD, the WMHS Chief Medical Officer, at many of these lectures.

Western Maryland Health System employs a full time Sexual Assault Forensic Evidence (SAFE) nurse. The SAFE nurse works very closely with local law enforcement and the Domestic Violence Advocate at the local District Attorney's office. This person acts as a resource to all employees and patients of WMHS on domestic violence issues. The SAFE nurse provides not only system employee education on domestic violence and forensics, but is active in presenting to a wide range of community organizations.

The Emergency Department staff coordinates activities for the observance of Emergency Medical Services Week. In addition to recognition of prehospital care providers for the critical role they play in the chain of survival, the staff uses this dedicated week as a forum to educate the public on the appropriate use of 9-1-1 and the emergency care system. Other duties of the Trauma Services Program Manager are to act as the Base Station Coordinator facilitating communication between hospital and prehospital personnel. The Trauma Services Program Manager also serves on the Region I EMS Advisory Council.

Moving forward into 2014, with the selfless commitment of our staff, Western Maryland Health System will continue to provide superior care to our citizens of Western Maryland and the surrounding communities.

Adult Burns

Johns Hopkins Burn Center Johns Hopkins Bayview Medical Center

The Johns Hopkins Burn Center is comprised of 2 units with a total of 20 beds. The higher acuity patients are treated and cared for in the Burn Intensive Care Unit, a 10-bed unit with mixed acuity—critical care and intermediate care. Patients with less demanding clinical needs and acuity are transferred or admitted directly to the Burn and Wound Unit. Stephen Milner, MD, DDS, is the director of the Burn Center. Dr. Milner is a professor of plastic surgery, Chief of the Division of Burns and Plastic Surgery, Director of the Michael D. Hendrix Burn Research Center, as well as the Surgical Director of the Wound Healing Center on the Johns Hopkins Bayview Medical Center campus. Kelly Krout, DNP, MS, RN, is the patient care manager for the Burn Center and the surgical intensive care unit. (See pages 79 to 81 for additional patient data.)

The Johns Hopkins Burn Center realizes the importance of community outreach and burn prevention, as well as clinical education for health care professionals throughout the region. Many programs currently exist to serve the community and our fellow healthcare colleagues. Examples of these community outreach efforts include:

- Fire Safety and Burn Program for adults and senior citizens
- Kiwanis Community Burn Prevention Program for school age children
- Safe Babies Program for newborns and their parents
- Juvenile Fire-setter Program for at-risk youth
- New Life Burn Society Survivor Support Group
- School Re-entry Program for burn survivor children
- Image Enhancement Program for burn survivors
- Survivors Offering Assistance in Recovery (SOAR) Program
- Annual participation in numerous statewide health and safety fairs

Examples of the clinical education programs currently provided by the Burn Center include:

- Advanced Burn Life Support (ABLS) provider certification courses
- Emergency Department Burn Poster Program
- Military Burn Education Program

- EMS/Firefighter Burn Course
- On-site clinical training for medical, nursing, rehabilitation, psychology, and dietician students, as well as EMS providers and firefighters

We also currently teach at numerous schools of nursing throughout the region and participate in the Emergency Department Consortium and many annual trauma update courses for both EMS and other health-care professionals.

In keeping with the mission and vision of Johns Hopkins Medicine, translational research is a key focus for the Johns Hopkins Burn Center. Currently there are multiple collaborations with many disciplines. The Michael D. Hendrix Research Laboratory actively studies the non-healing wound environment. At the bedside, studies are being sponsored by pharmaceutical companies and the US Department of Defense to improve wound and burn healing, including placental stem cell research. The purpose of this research is to study Burn Center methods and techniques in order to reduce mortality of burn victims in the field who are unable to reach medical facilities.

Adult Burns

The Burn Center at MedStar Washington Hospital Center

The Burn Center at MedStar Washington Hospital Center is the adult regional burn center for Southern Maryland, Northern Virginia, eastern West Virginia, and Washington, DC. The Burn Center is verified by the American Burn Association and the Committee on Trauma of the American College of Surgeons.

The Burn Center provides comprehensive, acute, and rehabilitative burn care through a multidisciplinary team approach. The burn surgeons are board-certified general surgeons with extensive experience in burn care, surgical treatment, and burn reconstruction. The Burn Team members—physicians, nurses, rehabilitation therapists, respiratory therapists, nutritionists, and social workers—are specially trained and experienced to address the special needs of burn patients.

This 20-bed facility features an intensive care unit with its own operating room and an intermediate care/rehabilitation unit, both of which provide wound care and progressive rehabilitation. With more than 500 admissions annually, the Burn Center provides care for an array of thermal, electrical, and chemical injuries as well as soft tissue lesions. The Burn Clinic provides outpatient burn care for more than 700 patients annually.

Pediatric Burns

Johns Hopkins Children's Center

From June 2012 to May 2013, the Pediatric Burn Service at Johns Hopkins Children's Center treated 279 children with severe burn injuries, with half of these patients admitted. (See pages 86 to 89 for additional pediatric burn data.) Dr. Stephen Milner is the Director of the Johns Hopkins Burn Center for both adults and children. Drs. Dylan Stewart, Richard Redett, Paul Colombani, Fizan Abdullah, and Jeffrey Lukish serve as Pediatric Burn Surgeons. Susan Ziegfeld, CRNP-Pediatric, is the Program Manager.

Care for pediatric burn patients at Johns Hopkins entered a new era in 2012 with the opening of the new 205-bed Charlotte R. Bloomberg Children's Center. From its soaring lobby, large operating rooms equipped for the most technically complex procedures imaginable, spacious patient rooms, and welcoming family facilities, the new building provides a hospital experience that matches the world-class medicine it affords. Critically injured burn patients are managed in the 40-bed Pediatric Intensive Care Unit, while other patients are managed on the 20-bed unit specifically designed for the care of burned children and their families. Additionally, more than 300 outpatient burned children are treated each year in the Pediatric Outpatient Burn Clinic located in the David M. Rubenstein Child Health Building. Specialized pediatric home nursing can be arranged for those who need additional outpatient care. In addition to caring for burned children in the Baltimore metropolitan area, we are working with surrounding children's centers to accept a larger percentage of burn patients by transfer, so that Maryland families may stay closer to home to receive care.

Pediatric burn care at Johns Hopkins is truly a multidisciplinary effort, with multiple subspecialists contributing to provide the best care for the burned child. This includes pediatric surgeons, intensivists, pain management specialists, plastic and reconstructive surgeons, pediatric infectious disease specialists, and rehabilitation physicians and therapists. We also utilize highly trained nurse practitioners who tend to the daily inpatient care of burned children. In 2012 we added a dedicated clinical psychologist to our team to assist both patients and families in dealing with a devastating injury.

Research and Quality Improvement (QI) are integral parts of the Pediatric Burn Center. Our most recent QI project to improve the care of burned children in the Pediatric Emergency Department was the "Burn Nurse Project," a training program for Pediatric emergency department nurses to assess, debride, and treat burned patients independently, allowing for consistent care and expedited transit through the emergency department. This novel approach was presented via a poster at a recent Emergency Nurses Association conference.

Susan Ziegfeld is a Master's Prepared Nurse who serves full-time as the Burn Program Manager. In this capacity she assumes all administrative functions of the program, including organizing systems for a multidisciplinary approach to care. In addition to her direct supervision of the Pediatric Burn staff, she functions as a Pediatric Nurse Practitioner at The Johns Hopkins Hospital assisting with the care of both inpatients and outpatients. She is also very involved with injury prevention initiatives and education by participating in a variety of committees and meetings on local, state, and national levels.

Quality care is of utmost importance to the Pediatric Burn Center. Burn Coordinator Katie Manger, BSN, assumes day-to-day responsibility for process and performance improvement activities, as well as chairing the Performance Improvement Committee along with the Trauma Director. She reviews all pediatric resuscitation documentation and monitors all QI filters on a daily basis. In addition to her development of the QI process, she functions as EMS Liaison. She corresponds with EMS providers, giving written and verbal feedback on patient status and care rendered in accordance with MIEMSS protocols. Ms. Manger serves on the Maryland Trauma Registry Education and Prevention Committee, is the co-chair for the Trauma QI Committee, chairs the hospital's Burn Mortality & Morbidity Committee, and serves on several other committees. She provides pediatric burn education throughout Johns Hopkins Children's Center, including orientation and ongoing continuing education.

Pediatric burn center staff provides burn-related education to EMS providers and to other hospitals throughout the country. Specialized pediatric burn nurses also educate elementary school students on burn and fire prevention initiatives.

Pediatric Burns

Children's National Medical Center

From June 2012 to May 2013, Children's National Medical Center, as a pediatric burn specialty referral center, treated 832 children from Maryland. Forty-seven Maryland children with burn injuries were admitted as inpatients. (See pages 86 to 89 for additional pediatric burn data.) Randall S. Burd, MD, PhD, is the Chief of the Trauma and Burn Service; Jennifer Fritzeen, MSN, RN, PCNS- BC, is the Trauma and Burn Program Manager; Amy Wright is the Trauma and Burn Clinical Coordinator; Elaine Lamb, MSN, CPNP, Elizabeth Leachman, MSN, CPNP, Catherine Walsh, MSN, CPNP, and Elizabeth Waibel, MSN, CPNP, are the Trauma and Burn Nurse Practitioners; Sally Wilson, BSN, RN, is the Injury Prevention, Education, and Outreach Coordinator; Elizabeth Carter, PhD, is the Trauma Epidemiologist; and Yu Yan, MSN, RN, is the Trauma Registry Coordinator.

The Children's National Medical Center has served as a Pediatric Burn Center in the State of Maryland for over three decades. Children's National is dedicated to the care of children in MIEMSS Region V, which includes Montgomery, Prince George's, Calvert, Charles, and St. Mary's Counties, and also in the western regions of the State.

An interdisciplinary team of pediatric specialists provides comprehensive emergency, critical, acute, and follow-up care for children who are burned by flames, scalded, or suffering from electrical burns. During the past year, 47 children from Maryland have been admitted to the Burn Service. The number of outpatient burn clinic visits totaled 592. In addition, 193 Maryland children were treated for minor burn injuries and discharged from the Children's National Medical Center Emergency Department. A child's burn wound can be treated under Non-Operating Room Anesthesia (NORA), significantly reducing pain during the treatment of a burn injury. In FY 2013 there were 25 Maryland children who received burn wound care utilizing NORA.

Working jointly with the Safe Kids District of Columbia, Safe Kids USA, the DC RISK WATCH[®] Champion Management Team, and the Injury Free Coalition for Kids of the District of Columbia (Injury Free DC), the Pediatric Trauma and Burn Center provides fire and burn safety education to communities in Maryland, Northern Virginia, and Washington, DC. In the past year, burn outreach and education has

interacted with over 7,000 families. Additionally, the Pediatric Burn Center staff provides EMS and emergency department education at surrounding hospitals and at EMS conferences.

The Curtis National Hand Center At MedStar Union Memorial Hospital

Located in Baltimore City, The Curtis National Hand Center at MedStar Union Memorial Hospital serves as the State's referral center for the specialized care of injuries to the hand, wrist, and elbow. In FY 2013, 1,444 patients with traumatic hand injuries were cared for at the Center. The unique nature of the services provided also draws patients from a broad geographic region including Pennsylvania, Delaware, Virginia, West Virginia, and Washington, DC.

The Curtis National Hand Center is known as one of the country's most advanced resources for the care of patients with elbow, forearm, wrist, and hand trauma. Having received the Congressional designation as the National Hand Center in 1994, the Center remains one of the world's premier facilities for the clinical care and study of the hand and upper extremity, in addition to being an advanced training center of orthopaedic, plastic, and general surgeons in the field.

The Curtis National Hand Center and MedStar Union Memorial Hospital (www.unionmemorial.org) remain committed to handling acute injuries and providing reconstructive surgery for Maryland's trauma victims. The focus on complex hand, wrist, and elbow injuries has long 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.

The repair of amputated and seriously injured upper extremities requires a coordinated effort of rapid transport, proper handling of injured limbs, precise surgical repair, physical and occupational therapy, and, most of all, a motivated patient. Over 31% of traumatic hand cases are transported through the Maryland EMS system (public safety ambulance or medevac helicopter) (Chart 1). The addition of an onsite heliport in 2009 has reduced travel time and improved the speed of intervention for the most critically wounded.

The Center's expertise in challenging bone and soft tissue trauma is supplemented by advanced microsurgery skills. The handling of fractures, complex soft tissue coverage problems, and amputations requiring replantation attempts continues to be the major focus of

The Curtis National Hand Center at MedStar Union Memorial Hospital

Chart 1.
Transport Mode

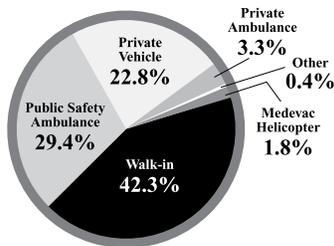


Chart 2.
Injury Type

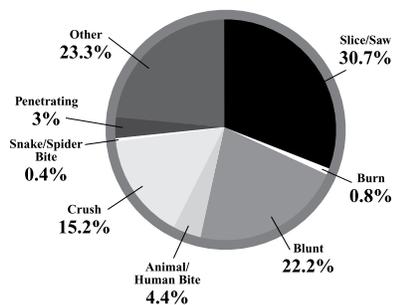


Chart 3.
Injury Location

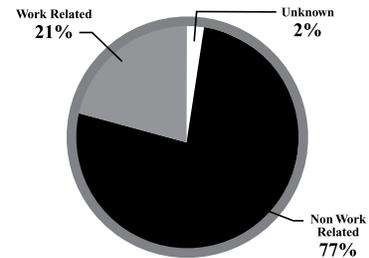
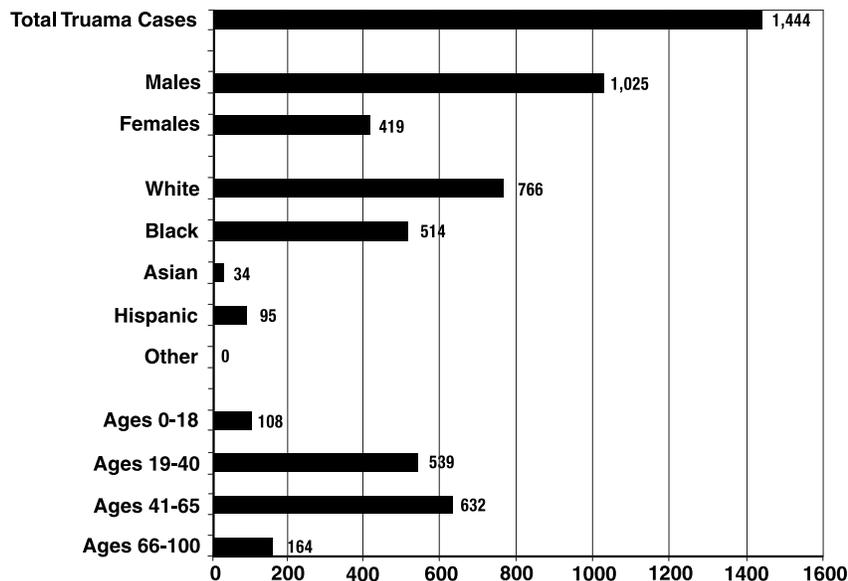


Chart 4.
MedStar Union Memorial Hand Trauma Demographics



the Hand Surgery Service at MedStar Union Memorial Hospital.

The acute trauma unit is staffed by specialists in orthopaedic and plastic surgery with subspecialty training in hand and upper extremity surgery. The team is available 24/7 to respond to a variety of injuries ranging from severing or crush injuries to infections and snakebites. Most hand injuries treated at the Center are the result of accidents with power saws, lawn mowers, snow blowers, or other machines that can cut, crush, or break hands (Chart 2) and most injuries occur outside of the work place (Chart 3). The majority of patients seeking services are male, white, and over the age of 40 (Chart 4).

The Curtis National Hand Center is one of the largest training centers for hand surgery. The surgeons of the National Hand Center have contributed some of the most important publications concerning the care of

the injured hand and upper extremity and they continue to lecture worldwide about the topic of hand trauma.

Research projects, funded by both internal and external sources, look at a wide range of pertinent questions, including those in microsurgery, surgery of the peripheral nerve, bone and soft tissue problems, and reconstruction after significant trauma. Collaborations with the region's scientists and other investigators promote current thinking and new developments in this vital area.

Maryland maintains the nation's premier network of institutions and physicians for trauma care in part because of the unique capabilities and availability of all trauma providers, including the Specialty Trauma Centers. The Curtis National Hand Center at MedStar Union Memorial Hospital is proud to be part of this network and supports the efforts to provide advanced care for Maryland citizens.



Center for Hyperbaric Medicine R Adams Cowley Shock Trauma Center

The Center for Hyperbaric Medicine at the R Adams Cowley Shock Trauma Center, University of Maryland Medical Center, is the statewide referral center for individuals who experienced diving incidents, carbon monoxide poisoning, smoke inhalation, and gas gangrene. In FY 2013, 270 patients were treated at the Center; 51% of the dive hours for patients treated were outpatient and 49% were inpatient. Established in 1965, the Center is able to provide treatment around-the-clock, 365 days a year. Robert Rosenthal, MD, is the Director of the Center for Hyperbaric Medicine.

Located within one of the highest volume trauma centers in the United States, the Center for Hyperbaric Medicine at the R Adams Cowley Shock Trauma Center is the only multi-place chamber in Maryland. Internationally recognized for its leadership and expertise in the clinical application of hyperbaric therapy, the Center is capable of accommodating 10 stretcher patients or 23 seated patients simultaneously. This large space is a comfortable alternative for claustrophobic patients who cannot tolerate small monoplace (single individual) chambers. Used to treat conditions such as decompression sickness, carbon monoxide poisoning, gas gangrene, delayed effects of radiation treatment, and non-healing wounds, hyperbaric oxygen therapy provides oxygen to all parts of the body in amounts greater than possible under normal conditions. This is accomplished by providing 100% oxygen under increased atmospheric pressure in a special chamber.

This chamber is equipped to provide 24/7 critical care under the direct supervision of specially trained critical care nurses. Conditions treated at the Center for Hyperbaric Medicine include:

- Carbon monoxide poisoning and smoke inhalation
- Acute gas embolism
- Decompression sickness (the bends)
- Necrotizing, acute soft tissue infections
- Clostridial and non-clostridial gangrene
- Compromised skin grafts and flaps
- Crush injuries
- Chronic refractory osteomyelitis
- Arterial insufficiencies
- Severe anemia
- Intracranial abscess
- Idiopathic sudden sensorineural hearing loss
- Delayed radiation injury

At the Shock Trauma Center, our team of physicians, nurses, respiratory therapists, and hyperbaric technologists work closely with referring physicians to ensure that patients are evaluated and receive a comprehensive treatment plan, which includes nutrition and appropriate wound care. Many of the conditions responsive to hyperbaric oxygen therapy can be successfully treated on an outpatient basis, including:

- Enhancement of healing in selected wounds, such as non-healing foot ulcers in patients with diabetes or peripheral vascular disease
- Damage to tissues following radiation therapy (radionecrosis)
- Chronic refractory (unresponsive to standard antibiotics) osteomyelitis

All hyperbaric treatments are supervised by specially trained physicians. The clinical staff includes Certified Hyperbaric Registered Nurses with critical care experience, Certified Hyperbaric Technologists, and a Certified Respiratory Therapist. Nursing care is provided by the critical care nurses who undergo atmospheric compression within the chamber at the patient's bedside. Because of the chamber's unique design and staffing, critically ill patients can receive hyperbaric treatment without any interruption in care.

The Center for Hyperbaric Medicine participates in a national registry of carbon monoxide patients run by the Centers for Disease Control and Prevention. Physicians, nurses, and technical members of the Center for Hyperbaric Medicine regularly lecture on hyperbaric medicine at regional and national conferences. Their audiences include a variety of healthcare professionals such as nurses, physicians, and emergency medical providers.

Maryland Eye Trauma Center The Wilmer Eye Institute at Johns Hopkins

The Wilmer Eye Institute is located within The Johns Hopkins Hospital campus in East Baltimore and is the first statewide eye trauma center in the United States. The main objectives of the eye trauma center are to provide optimal clinical management of severe ocular injuries, to conduct research into the natural history of eye trauma, to develop new treatments for ocular trauma, and to initiate and support eye trauma prevention activities. Michael P. Grant, MD, PhD, FACS, is the Director of the Center; the Eye Trauma Coordinator is Shailaja Chopde, MSN, RN; and the Associate Director for FY 2014 will be Fasika Woreta, MD. In November 2012, Dr. Grant was elected President of the American Society of Ocular Trauma.

For many years, The Wilmer Eye Institute (WEI) has established itself as “the premier eye care center of the world,” and has expertise in all aspects of eye disease as they relate to eye trauma, including oculoplastic surgery, neuro-ophthalmology, pediatric ophthalmology, anterior segment, glaucoma, uveitis, retinal surgery, and eye pathology. The WEI nurses have organized an Ocular Trauma Workshop, an eight-hour course that awards six hours of CEUs, offered quarterly to The Johns Hopkins Hospital staff nurses. The core curriculum for this workshop has been approved by MIEMSS.

The WEI nurses were also instrumental in coordinating the 30th annual Wilmer Nursing Conference. The theme of this year’s conference was “30 years of excellence in continuing education.” This conference was well attended by nurses, technicians, prehospital providers and other allied health professionals. Dr. Majed Alkharashi gave a presentation on *Traumatic Iritis*, followed by Dr Akrit Sodhi who presented *Identification of New Therapeutic Targets for the Treatment of Diabetic Eye Disease*.

The patient volume at the Wilmer Eye and Orbital Trauma Center continues to be significant. Last year 2,057 patients (ranging from 132 to 233 per month, with an average of 171) presented to The Johns Hopkins Hospital with acute ocular complaints requiring urgent ophthalmic consultation. Approximately 20 patients per month are found to have serious ocular injuries as defined by the American Society of Ocular Trauma. Final analysis of FY 2013 data is pending at the time of this report.

Dr. Michael Grant participated in several regional, national, and international educational events targeting prehospital care providers, acute care providers, as well as surgeons that care for ocular and orbital

trauma patients. This past April, Dr. Grant was a featured speaker at the Miltenberger Emergency Services Seminar held at the Wisp Resort in Western Maryland. The presentation, *Does the Patient Have an Eye Injury, What I Need to Know, and What I Need to Do*, was attended by approximately 50 prehospital providers and was well received. In November 2012 Dr. Grant delivered a presentation *Evaluation and Management of Ocular and Orbital Trauma* at the Critical Issues in Trauma seminar sponsored by Suburban Hospital, Johns Hopkins Medicine. A three-day cadaver-based course, *Fundamentals of Orbital and Mid-face Trauma and Reconstruction*, sponsored by the AO Foundation and chaired by Dr. Grant, was offered in September 2012 in New Orleans, Louisiana. The course, offered for a fourth time and featuring an international and multidisciplinary faculty, was quite successful, and will be offered again in spring 2014. Dr. Grant also co-chaired an advanced course on complex facial reconstruction and participated in a course on treatment and reconstruction of ballistic facial injuries, both sponsored by the AO Foundation. This past academic year, the AO Foundation also sponsored advance courses on orbital reconstruction featuring Dr. Grant in Prague, Czech Republic, and Beijing, China.

The leadership of WEI is concerned about the rising cost of health care in general and the cost of providing high quality, sub-specialty care for trauma patients specifically. One of the reasons sub-specialty referral centers are thought to be desirable is that the combination of specialization and volume may drive the cost of treatment down. This has been shown to be true for some elective procedures, but never for urgent or emergent procedures. In a manuscript recently accepted for publication in *Ophthalmology*, Drs. Grant and John Koo, along with others from WEI, have shown a 50% (statistically significant) reduction in cost of performing orbital reconstruction compared to all other hospitals (excluding military/Veterans Administration) in Maryland.

Neurotrauma Center R Adams Cowley Shock Trauma Center

The Neurotrauma Center at the R Adams Cowley Shock Trauma Center, University of Maryland Medical Center, provides comprehensive management for patients with injuries of the brain, spinal cord, and spinal column. Bizhan Aarabi, MD, FACS, FACSC, is the Co-Medical Director of the Neurotrauma Center and Chief of Trauma Neurosurgery. Deborah Stein, MD, MPH, FACS, FCCM, is the Co-Medical Director of the Neurotrauma Center and the Medical Director of the Neurotrauma Critical Care Unit.

As the state's designated referral center for head and spinal injuries, the Neurotrauma Center, located within the Primary Adult Resource Center (PARC), employs a multidisciplinary team of clinical experts. The team utilizes evidence-based treatment strategies designed to ensure immediate diagnostic and therapeutic access for patients with traumatic brain, spinal column, and spinal cord injuries.

The Neurotrauma Center provides the following:

- A dedicated, highly trained, and experienced multidisciplinary clinical staff
- Comprehensive radiology service and the Mirmiran Foundation Diagnostic Imaging Suite with a dedicated high-speed 64 slice computed tomography (CT) scanner, a dedicated 40 slice CT scanner, and a dedicated trauma angiography suite accessible on a 24-hour basis
- 12 critical care/intensive care beds
- 12 intermediate care beds with the capacity for additional beds as needed in the adjacent University of Maryland Medical Center
- A trauma and specialty care ambulatory center with 14 exam rooms
- Respiratory, physical, occupational, and speech 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

As a statewide clinical resource, the staff and faculty of the Neurotrauma Center avails its clinical and research expertise globally to healthcare providers.

The Neurotrauma Critical Care and Intermediate Care Units provide multidisciplinary care to critically ill patients who have sustained primarily central nervous system injury and may have other associated injuries or organ dysfunction. From June 2012 to May 2013, the Neurotrauma Center provided care to 1,720 patients with traumatic brain injury, 231 patients with spinal column or spinal cord injuries, and 485 patients who suffered from both traumatic brain and spinal column or spinal cord injuries.

Those with severe brain injury receive a multisystem assessment with intracranial pressure and cerebral oxygenation parameters closely monitored so factors that may cause secondary brain injury are rapidly recognized and treated and patient outcomes are optimized. Neurosurgeons are readily available to intervene if necessary and perform craniotomies for hematoma evacuation, gunshot wound debridement, elevation of depressed skull fractures, decompressed craniectomies, and cranioplasties.

Patients with spinal cord injury, often with cervical spine injuries, are treated using sophisticated respira-

tory care protocols and, when appropriate, implantation of a diaphragmatic pacer that enables successful weaning from mechanical ventilation for most patients. Studies conducted in the Neurotrauma Critical Care Unit led to the development of evidence-based interventions routinely used by the multidisciplinary team to prevent multisystem complications prevalent in many spinal cord injured patients. Dr. Bizhan Aarabi and Dr. Daniel Gelb, an orthopaedic spine surgeon, served as two of the authors on the evidence-based "Guidelines for Management of Acute Cervical Spine and Spinal Cord Injuries" published in the March 2013 issue of *Neurosurgery*. Surgical interventions for spinal column injuries include discectomies, laminectomies, arthrodesis, and open reduction internal fixations.

Educational programs are offered for medical students, residents, fellows, and nurses who seek to improve the care and outcome of patients in the aftermath of neurotrauma. The Neurotrauma Center's emphasis on early patient mobilization as the beginning of the rehabilitative process helps to decrease the morbidity associated with neurologic injury. Post-acute inpatient and outpatient services are primarily provided by the University of Maryland Rehabilitation and Orthopaedic Institute and the University of Maryland Medical Center Midtown Campus. In collaboration with other medical centers, the Neurotrauma Center has an important role in advancing the medical communities' understanding of severe head and spinal trauma. Ongoing multisite studies continue at the Shock Trauma Center focusing on pharmacologic interventions that may improve outcomes of patients with head or spinal cord injury.

Pediatric Trauma Center at Johns Hopkins Children's Center

From June 2012 to May 2013, the Pediatric Trauma Center at Johns Hopkins Children's Center treated 831 severely injured children under the age of 15 years. (See pages 82 to 85 for additional pediatric trauma data.) Dylan Stewart, MD, FACS, is the Director of the Pediatric Trauma Service. Susan Ziegfeld, CRNP-Pediatric, is the Program Manager.

Pediatric trauma at Johns Hopkins enjoyed the first year of a new era with the opening in April 2012 of our new clinical building, the Charlotte R. Bloomberg Children's Center. This incredible facility is a state-of-the-art hospital designed for 21st century pediatric medicine. With a completely redesigned pediatric emergency department, a new technologically advanced operating room suite, an expanded Pediatric

Intensive Care Unit, and spacious, private patient rooms, families were welcomed to a completely new hospital experience. Extensive planning went into every aspect of the new building, and the pediatric trauma team played an integral part in the design, especially of the two dedicated pediatric trauma resuscitation rooms.

Dr. Dylan Stewart is now in his fourth year as the Director of Pediatric Trauma and sits on the American Pediatric Surgical Association's Committee on Trauma. Dr. Stewart is also one of the inaugural members of the newly formed Pediatric Trauma Society.

Susan Ziegfeld is a Master's Prepared Nurse who serves as the full-time Program Manager. In addition to her administrative duties, she functions as a Pediatric Nurse Practitioner within Johns Hopkins Children's Center, assuming responsibility for the care of both inpatients and outpatients. At the state level, she serves on the Maryland Trauma Registry Education and Prevention (MTREP) Committee, the Quality Improvement (QI) Committee, and is on the Executive Committee for the Maryland Trauma Center Network (TraumaNet). At the national level, she serves on the Society of Trauma Nursing-Pediatric Special Interest Group and is an active member of the Eastern Association for the Surgery of Trauma and the Pediatric Trauma Society.

Members of the Pediatric Trauma Team continue to be very active in educational activities. Since its inception in 2003, the Pediatric Trauma Center (PTC) has provided the course director and instructors for the Advanced Trauma Care for Nurses (ATCN) program, as well as the Advanced Trauma Life Support (ATLS) program for physicians. This program has been endorsed by the Maryland Chapter of the American College of Surgeons Committee on Trauma as well as the Society of Trauma Nurses. Benefits of ATCN include an educational, collaborative, and synchronized team approach to trauma care with the participants of the concurrently-taught ATLS course. Courses are held monthly in collaboration with the R Adams Cowley Shock Trauma Center and the US Air Force Center for Sustainment of Trauma and Readiness Skills (C-STARS). Air Force nurses, as part of the C-STARS program, receive specialized training in pediatric trauma and burn care before they are deployed. Members of the Pediatric Trauma and Burn Team provide local, regional, and national education to the healthcare community.

The newest educational activity for the PTC has been collaboration with the sophisticated Johns Hopkins Simulation Center. Pediatric trauma simulations can now be performed both in the Simulation Center as part of a larger educational mission and also

throughout the hospital. The simulations provide realistic teaching experiences that offer healthcare providers the opportunity to provide direct feedback for modification and improvement purposes. The Simulation Center has begun offering pediatric trauma training courses to regional healthcare providers with an extremely enthusiastic response.

Trauma Coordinator Katie Manger, BSN, assumes day-to-day responsibility for the process and performance improvement activities, as well as chairing the Performance Improvement Committee along with the Trauma Director. She reviews all pediatric resuscitation documentation and monitors all QI filters on a daily basis. In addition to her development of the QI process, she functions as EMS Liaison. She corresponds with EMS providers, giving written and verbal feedback on patient status and care rendered in accordance with MIEMSS protocols. She also provides pediatric trauma education throughout Johns Hopkins Children's Center, including orientation and ongoing continuing education. Ms. Manger coordinates and facilitates the preparation of protocols and policies that reflect evidence-based practices in pediatric trauma care. Ms. Manger serves on the MTREP Committee, is the co-chair for the Trauma QI Committee, chairs the hospital's Trauma Mortality & Morbidity Committee, and is an ATCN instructor.

In 2012 the PTC added Lauren Davis, a Master's Prepared Social Worker, to its team. Ms. Davis is responsible for planning, evaluating, and maintaining all injury prevention programs. She provides injury prevention education for patients and families on the units, as well as in the outpatient center. Education is tailored to each child's age and developmental level. Topics include home safety, fire prevention, water safety, car seat safety, falls prevention, and more. In addition, Ms. Davis utilizes the pediatric trauma and burn data to develop programs that meet the needs of the patients and families. For example, she is currently researching high risk areas for pedestrian injuries, using geographic information systems (GIS) mapping, in order to develop a pedestrian safety program that will help reduce those injuries. Ms. Davis also organizes health education programs and services to meet the needs of the community. She is a trained Child Passenger Safety Technician and can provide car seat education and demonstrations. In summer 2013 she co-organized an inaugural car seat safety inspection for the Children's Center. Starting in fall 2014, Ms. Davis will be working on a project in the Pediatric Emergency Department, through special grant funding, to educate parents and patients on bike helmet safety. Ms. Davis serves on the patient education committee in the Children's Center, as well the Hopkins Trauma Outcomes Research

Group. On a national level, Ms. Davis is a member of the Safe States Alliance as well as the Pediatric Trauma Society.

Other significant resources are available to Johns Hopkins PTC patients:

The *Children's Safety Centers (CSC)* is a partnership between Johns Hopkins Center for Injury Research and Policy and Johns Hopkins Department of Pediatrics, including the PTC. The CSC provides free, personalized education by a safety health educator, access to reduced-cost safety products, and specialized injury prevention services such as car safety seat installations and checks. Injury prevention topics covered by the CSC include the broad variety of home, pedestrian, and child passenger safety important to children's health. The CSC has been providing services to the larger Hopkins community since 1997.

Introduced in 2004, the *Children Are Safe (CARES) Mobile Safety Center* is a 40-foot vehicle built as a house on wheels that has interactive exhibits and low-cost safety products. It travels to Baltimore City neighborhoods to teach parents and caregivers about the injury risks that children face at home and ways to make the home a safer place. Led by the Center for Injury Research and Policy, CARES was created through a partnership with the Baltimore City Fire Department, the Maryland Institute College of Art, the Maryland Science Center, and the PTC.

Together, the CSC and CARES are significant resources for children and families that provide education and injury prevention supplies, such as car seats and bike helmets, at a reduced cost.

Pediatric Trauma Center Children's National Medical Center

From June 2012 to May 2013, the Children's National Medical Center, as a pediatric specialty referral center, treated 751 Maryland children for trauma injuries. Of these, 423 children had multiple trauma injuries, with 239 of the 423 brought directly to Children's National Medical Center through the Maryland EMS system. A total of 312 trauma patients were transfers to Children's National after stabilization in another emergency department. (See pages 82 to 85 for additional pediatric trauma data.) The staff at Children's National Medical Center includes: Randall S. Burd, MD, PhD, Chief of the Trauma and Burn Services; Jennifer Fritzeen, MSN, RN, Program Manager; Amy Wright, BSN, RN, Trauma Coordinator; Elaine Lamb, MSN, CPNP, Elizabeth Leachman, MSN, CPNP, Catherine Walsh, MSN, CPNP, and Elizabeth Waibel, MSN, CPNP,

Trauma and Burn Nurse Practitioners; Sally Wilson, BSN, RN, Injury Prevention, Education, and Outreach Coordinator; Elizabeth Carter, PhD, Trauma Epidemiologist; and Yu Yan, MSN, RN, Trauma Registry Coordinator.

Children's National Medical Center, a Level I Pediatric Trauma Center, serves the pediatric communities of Region V, which includes Montgomery, Prince George's, Calvert, Charles, and St. Mary's Counties, as well as those in the western regions of the state, by caring for children with multiple trauma and burns.

Children's National provides pediatric emergency and trauma education to physicians, nurses, and prehospital providers. Thirteen courses in Pediatric Advanced Life Support are offered annually. *Advances in Pediatric Emergency Medicine* is a course offered annually to community physicians. Numerous pediatric trauma outreach educational programs are offered by nurses and specialty physicians to all levels of providers throughout the Maryland EMS System.

The trauma service at Children's National has a robust trauma research program focusing on the care of children and trauma team performance. The trauma research team is in year three of a grant funded by MIEMSS' Emergency Medical Services for Children (EMSC) Program and the Health Resources and Services Administration to develop a trauma checklist to be used in the assessment and evaluation of pediatric trauma patients during resuscitation. Drs. Randall Burd and Elizabeth Carter have acquired additional funding through the National Institutes of Health to investigate various technologies for use in treating pediatric trauma.

Community education and outreach has continued to expand at Children's National. Through our outreach program we have provided education to thousands of families in Maryland covering various topics including burn prevention, pedestrian safety, abuse prevention, and car seat safety. Children's National is currently partnering with Johns Hopkins Children's Center to develop and launch a prevention campaign to decrease the number of children falling out of windows.

Since its inception in 1987, Safe Kids Worldwide, the injury prevention mission of Children's National, has contributed to a 45% decrease in child fatalities from unintentional injuries to children ages 14 and under by promoting changes in attitudes, behaviors, laws, and the environment. In the United States, this reduction has saved an estimated 38,000 children's lives. Working through 350 Safe Kids coalitions in the United States and 18 other countries, Safe Kids delivers proven programs at the grassroots level to prevent unintentional injury. By mobilizing communities at

the local level, Safe Kids Worldwide provides public education programs, facilitates engineering and environmental modifications, encourages the enforcement of laws and regulations, and conducts research to drive our programs and determine the efficacy of our efforts. Safe Kids activities for the State of Maryland are available on www.safekidsmd.org.

The EMSC National Resource Center was established in 1991 to assist the federal EMSC program in improving the pediatric emergency care infrastructure in the United States and its territories. The program provides funding to implement programs to enhance the quality of medical and trauma care provided to children and youth. Much of the program's focus since 2005 has been on helping states to achieve defined performance measures and reduce gaps in pediatric emergency care. These measures address availability of pediatric on- and off-line medical direction, availability of pediatric equipment on ambulances, hospital facility recognition programs for pediatric emergency and trauma care, hospital pediatric interfacility transport agreements and guidelines, and pediatric educational requirements for the recertification of prehospital emergency care providers. Resources developed for grantees, community leaders, and parents include fact sheets on the program as well as performance measures, the EMSC Program Strategic Plan, a project implementation guide, a Family Advisory Network tool kit, and more. All resources may be found on Children's National's EMSC website at www.childrensnational.org/emsc.

Poison Consultation Center Maryland Poison Center

The Maryland Poison Center (MPC) is a certified regional poison center that provides 24/7 emergency poison information to the public and health professionals in the state. The MPC is accessed by calling the nationwide Poison Help telephone number: 800-222-1222. A division of the University of Maryland School of Pharmacy, the MPC is designated by the Maryland Department of Health and Mental Hygiene as a regional poison center for Maryland. MPC also serves as a specialty referral center for MIEMSS. Bruce D. Anderson, PharmD, DABAT, is Director of Operations and Suzanne Doyon, MD, ACMT, is Medical Director.

The Maryland Poison Center (MPC) observed its 40-year anniversary in 2012. To mark the occasion, the University of Maryland School of Pharmacy hosted a celebration attended by faculty, staff, professional colleagues, and former Poison Center employees. Joshua Sharfstein, MD, Secretary of the Maryland Department

of Health and Mental Hygiene provided the keynote address. In the 40 years since it opened, the poison center has responded to more than 2 million calls. The poison specialists who work at the MPC are pharmacists and nurses who are certified as Specialists in Poison Information by the American Association of Poison Control Centers. Managing at least 2,000 human exposure poisoning cases and passing a national certification examination are required to become a certified specialist. The 13 specialists at the MPC have over 240 years of combined poison center experience, ensuring that callers have access to experienced, qualified, and well-trained staff.

In calendar year 2012, the MPC received 62,229 calls. While 34,673 of these calls involved a human exposure, the remaining 27,556 were animal exposures and requests for information where no exposure occurred. Forty-four percent of poison exposures involved children under the age of six. Sixty-six percent of the cases reported to the MPC were managed at a non-healthcare facility site, such as the home, school, or workplace. Maryland EMS providers consulted with the MPC on 2,032 cases in 2012. In 445 of those cases, transportation by EMS to a healthcare facility was deemed unnecessary based on Poison Center advice. Safely managing patients at the site of the exposure saves millions of dollars in unnecessary healthcare costs. It also allows more efficient and effective use of limited health care resources.

The Maryland Poison Center continues to work closely with the National Capital Poison Center and state and national agencies to monitor for possible chemical and biological weapons exposures and public health events throughout Maryland and the Washington, DC, region. The MPC's data collection system allows data to be submitted in real time to a nationwide poison center surveillance system. An automated symptom and substance outlier detection strategy is used to identify evolving patterns or emerging clusters of exposures.

Research is conducted by Maryland Poison Center staff to advance the prevention, diagnosis, and treatment of poisonings. Dr. Suzanne Doyon, along with Drs. Mary Ripple and David Fowler (State of Maryland Office of the Chief Medical Examiner), won the Best Platform Award at the 2012 North American Congress of Clinical Toxicology for their research presentation, "Comparison of exposure fatalities from the medical examiner's office and the poison center." Dr. Doyon also took the top prize in the 2012 Maryland Health Data Innovations Contest for her submission of "Improving the Reporting of Fatal and Non-Fatal Drug Overdoses." The competition was sponsored by the Maryland Department of Health and Mental Hygiene, the Chesapeake Regional Information System for Our

Patients (CRISP), and the Abell Foundation to identify innovative and practical ideas for using clinical information on a patient population to advance public health. Other areas of research that resulted in presentations at scientific meetings or publications in 2012 included:

- Unexpected late rise in plasma acetaminophen concentrations in acute acetaminophen overdose
- Comparison of citalopram and other selective serotonin reuptake inhibitor ingestions in children
- Decrease in therapeutic errors involving prescription cough and cold medications in young children
- Comparison of toxicity from exposures to buprenorphine or methadone with and without benzodiazepines
- Atypical antipsychotic exposures in young children
- Fatalities from acetaminophen combination products reported to poison centers

The Maryland Poison Center’s public education efforts are intended to help increase awareness of the poisons that are found in every home, business, and school and to help prevent poisonings from occurring. The MPC strives to make sure that everyone knows that if a poisoning occurs, they can quickly and easily get information by contacting the Maryland Poison Center, 24/7. In 2012 the MPC provided speakers and/or materials for 78 programs in 15 Maryland counties, Baltimore City, and Washington, DC. The programs and events attended by the MPC staff reached over 3,500 people. Several organizations partnered with the MPC to provide education to their patients, customers, clients, and students. These organizations included fire departments, police departments, hospitals, health departments, pharmacies, hospital perinatal education programs, CPR instructors, parish nurses, Red Cross, Head Start, and Healthy Start programs. In all, more than 41,000 pieces of educational material (e.g., brochures, magnets, telephone stickers, Mr. Yuk stickers, and teacher’s kits) were distributed at these programs and by these organizations. Approximately 102,000 additional pieces of material were mailed to individuals and groups who requested them.

Fifteen county school systems and daycare centers used educational materials from the MPC in their classrooms. All told, more than 17,000 pieces of educational material were used in or distributed to schools throughout Maryland. The MPC also partnered with the Frederick County Health Department and Frederick County Public Schools to conduct a Pharmacist Adopt-A-School program. In this program, local volunteer pharmacists are trained to present a poison and medicine safety program to first-grade students. In the spring of 2012, 11 Frederick County elementary schools

participated in the program, reaching over 1,000 first-grade students and their families. The program was also conducted in Carroll County through a partnership with Carroll County Health Department and Carroll County Public Schools. The volunteer pharmacists visited nine schools reaching over 700 first-grade students. In both counties, all children received educational materials to take home and share with their families. In an effort to provide additional poison prevention information to the public, the MPC publishes “Poison Prevention Press,” a bimonthly e-newsletter highlighting various poison prevention topics.

National Poison Prevention Week (March 18–24, 2012) activities included mailings to emergency departments throughout the state. A Poison Prevention Week poster contest for public schools in Baltimore City was co-sponsored by the MPC and Safe Kids Baltimore. The grand-prize winning poster has been used throughout the state to promote poison safety.

Professional education is targeted toward the special needs of health professionals. Programs and materials are designed to help the clinician better manage poisoning and overdose cases. In 2012, 66 programs were conducted at hospitals, fire departments, colleges, conferences (state, regional, and national), and through webinars. These programs were attended by more than 9,200 EMS providers, physicians, nurses, pharmacists, physician assistants, and others. Podcasts were recorded for broadcast on two websites devoted to continuing education for EMS providers and nurses: MedicCast.com and NursingShow.com. The Maryland Poison Center also provides on-site training for health professionals. In 2012 more than 70 EMS providers, paramedic students, physicians, and pharmacists came to the MPC to learn more about the assessment and treatment of poisoned patients. The MPC publishes *ToxTidbits*, a monthly newsletter for health professionals that contains important toxicology information, updates, and news. Some of the topics addressed in 2012 included: Baclofen Overdoses, Intranasal Naloxone, CroFab, and Treatment of Warfarin Over-anticoagulation. *ToxTidbits* is emailed to subscribers and faxed to every emergency department in our service area. Current and past issues of *ToxTidbits* and information on how to subscribe to receive all of the MPC’s e-newsletters can be found on our website at www.mdpoison.com.

Reason for Poisoning (CY 2012)

Circumstance	Number of Patients	Percentage
Unintentional	25,846	74.5
Intentional	7,002	20.2
Adverse Reaction	1,260	3.6
Other and Unknown	565	1.6
TOTAL	34,673	100.0

Medical Outcome of Poisoning (CY 2012)

Medical Outcome	Number of Patients	Percentage
No Effect / Minor Effect	30,593	88.2
Moderate Effect	2,274	6.6
Major Effect	237	0.7
Death	36	0.1
Other and Unknown	1,553	4.4
TOTAL	34,673	100.0

NOTE: The medical outcome is assessed based on the inherent toxicity of the agent and the severity of the clinical manifestations.

Location of Poisoning Exposure by Region (CY 2012)

Region	Number of Exposures	Percentage
Region I (Garrett, Allegany)	921	2.7
Region II (Washington, Frederick)	3,028	8.7
Region III (Carroll, Howard, Harford, Anne Arundel, Baltimore County, Baltimore City)	21,688	62.5
Region IV (Cecil, Kent, Queen Anne's, Talbot, Caroline, Dorchester, Wicomico, Worcester, Somerset)	3,640	10.5
Region V (*Montgomery, *Prince George's, Charles, Calvert, St. Mary's)	3,396	9.8
Unknown County/ Other state	2,000	5.8
TOTAL	34,763	100.0

*NOTE: Routing for the nationwide telephone number automatically connects callers from Montgomery and Prince George's Counties to the National Capital Poison Center in Washington, DC. Some callers from these counties reach the Maryland Poison Center by dialing local telephone numbers still in service. This report reflects calls to the Maryland Poison Center only. An additional 17,906 human exposures in Maryland were reported to the National Capital Poison Center in 2012.

Rehabilitation

The vision of MIEMSS is the elimination of preventable deaths and disabilities due to sudden illness or injury through an integrated system of prevention, intervention, and rehabilitation. This integrated system is known as the trauma care continuum. Rehabilitation is the cornerstone of "post-trauma" care. It is the phase of emergency care that enables the individual to return to a maximum level of function and, in most cases, to return as a productive member of society.

Top Ten Destinations of Patients (Ages 15 & Over) Who Went to Inpatient Rehabilitation Facilities (June 2012 to May 2013)

Source: Maryland State Trauma Registry

Rehabilitation Center	Number
Adventist Health Care	44
Future Care	46
Genesis Long-Term Care Facilities	226
Good Samaritan Hospital of Maryland	67
Kernan Hospital	609
Lorien Health Systems	49
Maryland General Hospital	41
Meritus Medical Center	42
National Rehabilitation Hospital, Washington, DC	38
Sinai Rehabilitation Hospital	79

Note: Total patients ages 15 and over who went to rehabilitation centers = 2,124.

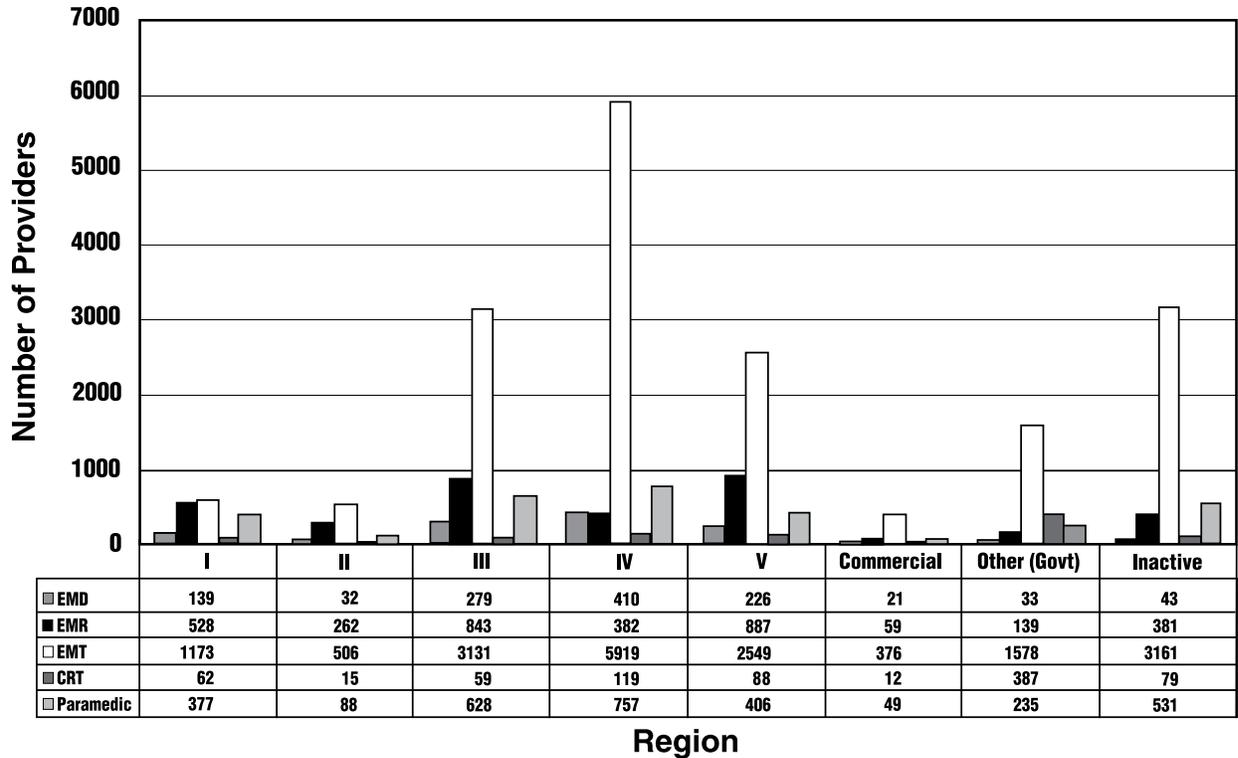
Trauma patient rehabilitation begins the first day the patient enters a trauma center with the goal of restoration to pre-injury status or with the best functional outcome possible given the injury sustained. Collaborating with the trauma team, rehabilitation professionals in trauma centers assess patients for rehabilitation needs and goal plans are developed and tailored for various therapy adjuncts. The Maryland Trauma System recognizes rehabilitation as a necessary part of the continuum of care delivered in the state for patients who have experienced traumatic brain, multi-trauma, and orthopaedic injuries. The trauma centers provide full in-house rehabilitation service for long-term (sub-acute) care or have transfer agreements with rehabilitation facilities to provide this specialized care.

Rehabilitation services are provided in hospitals, acute inpatient rehabilitation hospitals, long-term care facilities, home care, outpatient services, and community-based rehabilitation programs. During FY 2013 trauma centers in Maryland referred 2,124 trauma patients ages 15 and over to inpatient rehabilitation services. The ten rehabilitation facilities receiving the most patients are listed above.

MARYLAND EMS STATISTICS

Number of EMS Providers (Primary Affiliation) by Region

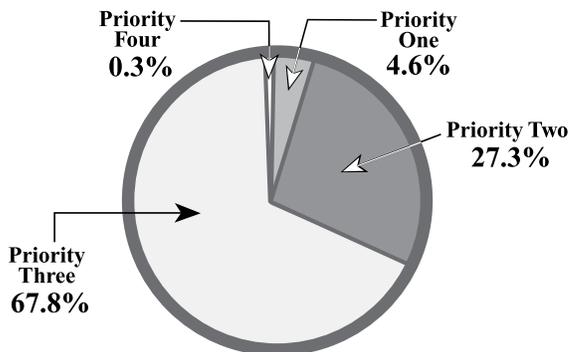
(As of June 30, 2013)



Types of EMS Calls

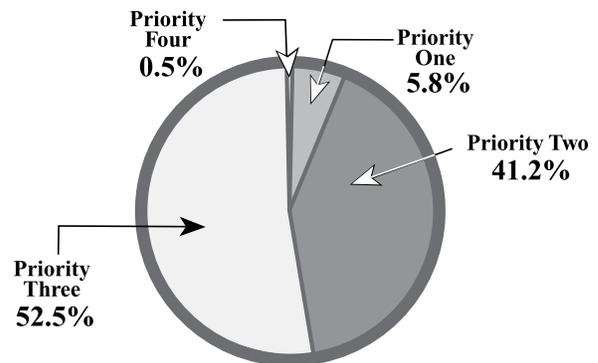
Patient Priority For Injury Transports

Calendar Year 2012



Patient Priority For Medical Transports

Calendar Year 2012



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

electronic Patient Care Reporting Records Submitted to MIEMSS by Maryland Jurisdictions

The electronic Maryland EMS Data System (eMEDS[®]) is a 3rd generation system, hosted by MIEMSS, which enables Maryland's EMS providers to document, submit, and produce an electronic patient care record. Additionally, it serves a primary resource to query data about EMS demand, response, and outcome.

eMEDS[®] was launched in the winter of 2011 with implementation of a pilot program in three jurisdictions (Cecil, Harford, and Queen Anne's Counties). As of June 2013, 21 of 24 jurisdictional EMSOPs in Maryland enter data to eMEDS[®] either by uploading data via a local device with internet connectivity or by logging onto a dedicated website to enter call information directly. Prince George's County currently submits key data elements electronically from its own proprietary system. Until March 4, 2013, when it implemented eMEDS[®], Frederick County also submitted patient care reports via a third party system. The table below demonstrates jurisdictional participation by date of implementation and monthly record volume for the first six months of CY 2013.

ePCR Records Submitted to MIEMSS per Month								
Reporting Between: 1/1/2013 - 06/30/2013								
Jurisdictional Total	eMEDS [®] Implementation	13-Jan	13-Feb	13-Mar	13-Apr	13-May	13-Jun	Total
Allegany County	1-Oct-11	1,006	839	941	1,043	1,083	1,034	5,946
Anne Arundel County	21-Feb-12	6,791	5,946	6,270	6,455	6,484	6,499	38,445
Baltimore City	1-Nov-11	18,081	15,489	17,119	16,957	17,645	17,438	102,729
Baltimore County	22-Feb-12	10,394	8,756	9,410	9,594	9,899	9,251	57,304
Calvert County	1-Jan-13	1,399	1,126	1,233	1,203	1,246	1,200	7,407
Caroline County	1-Jun-13	563	479	431	426	465	528	2,892
Carroll County	1-May-12	1,730	1,425	1,561	1,503	1,532	1,538	9,289
Cecil County	4-Feb-11	2,239	1,932	1,954	1,885	2,136	2,172	12,318
Charles County	N/A	1,950	1,712	1,944	1,758	1,936	1,948	11,248
Dorchester County	1-Jan-13	518	428	493	378	456	496	2,769
Frederick County	4-Mar-13	<i>3,169</i>	<i>2,939</i>	<i>3,137</i>	<i>2,999</i>	<i>3,323</i>	<i>3,297</i>	18,864
Garrett County	1-Oct-11	306	264	284	229	279	254	1,616
Harford County	4-Feb-11	2,634	2,208	2,431	2,320	2,382	2,376	14,351
Howard County*	14-May-13					1,483	2,429	3,912
Kent County	1-Mar-12	433	439	506	408	476	504	2,766
Montgomery County*	N/A							0
Prince George's County	N/A	<i>15,319</i>	<i>13,205</i>	<i>13,917</i>	<i>13,801</i>	<i>14,324</i>	<i>13,215</i>	83,781
Queen Anne's County	4-Feb-11	713	596	642	671	706	741	4,069
Somerset County	1-Dec-12	282	258	263	235	247	286	1,571
St. Mary's County	1-Oct-12	1,637	1,401	1,625	1,685	1,708	1,562	9,618
Talbot County	16-Jan-12	473	418	430	465	466	412	2,664
Washington County	19-Dec-11	1,993	1,793	1,888	1,968	2,168	2,171	11,981
Wicomico County	15-Nov-12	1,211	1,022	1,175	1,093	1,267	1,103	6,871
Worcester County	1-Jan-13	752	616	740	703	1,054	1,299	5,164
Jurisdictional Total								
		73,593	63,291	68,394	67,779	72,765	71,753	417,575

Note: Figures in bold represent records submitted via the electronic Maryland Ambulance Information System (eMAIS[®])
 Italicized figures represent electronic data submitted via another system and uploaded to eMEDS[®].

* Prior to May 14, 2013, Howard County was reporting under the MAIS format and are in the process of completing those submissions to MIEMSS. At the time of this report, Montgomery County has not yet begun to submit electronic patient care reports.

Public Safety EMS Units

Patient Transportation Vehicles

Region	Ambulances						Ambu Buses		
	BLS			ALS			Type I	Type II	Type III
	Inservice	Ready Service	Reserve Unstocked	Inservice	Ready Service	Reserve Unstocked	20 + Pts	19 - 20 Pts	< 10 Pts
Region I	0	0	0	32	0	0	0	0	0
Region II	32	2	5	13	10	0	0	0	0
Region III	19	2	41	173	43	37	0	2	0
Region IV	47	3	0	129	15	0	0	1	0
Region V	128	17	19	52	4	14	3	0	0
STATEWIDE TOTAL	226	24	65	399	72	51	3	3	0

Source: Vehicle data reported by the Jurisdictional 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

- **Inservice:** Fully stocked and staffed unit ready to be dispatched
- **Ready Reserve:** Fully stocked, but not staffed, unit. Could replace an Inservice unit or be added to Inservice fleet by calling in additional personnel
- **Reserve Unstocked:** Ambulance outfitted to accept cots and equipment. Can be used to replace an Inservice unit by transferring supplies, equipment, and personnel. Can be added to Inservice fleet with additional supplies, equipment, and personnel

Ambu Bus: A passenger bus configured or modified to transport as many as 20 patients on stretchers

Public Safety/Non-Transport Vehicles

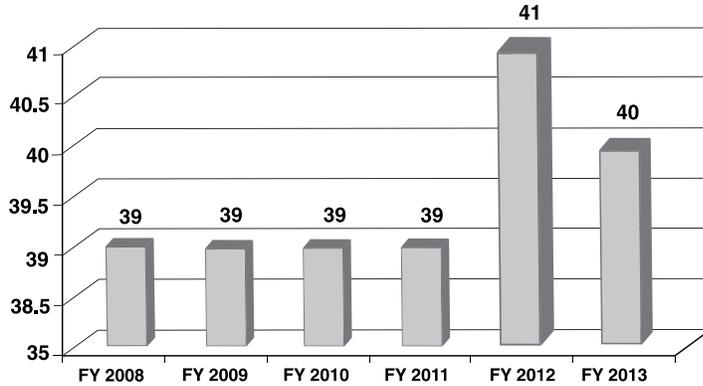
Region	Non-Transport Support					Disaster Supplies*		
	BLS First Response	Suppression BLS First Response	ALS Chase			MCSU Type I (100+ Pts)	MCSU Type II (50 Pts)	MCSU Type III (25 Pts)
			Non-Supervisory	Supervisory	ALS Engines			
Region I	14	7	6	0	2	0	1	0
Region II	37	43	16	13	1	0	1	3
Region III	45	274	16	25	52	9	0	1
Region IV	36	93	24	30	5	1	2	5
Region V	57	183	15	7	35	5	3	1
STATEWIDE TOTAL	189	600	77	75	95	15	7	10

Source: Vehicle data reported by the Jurisdictional Programs

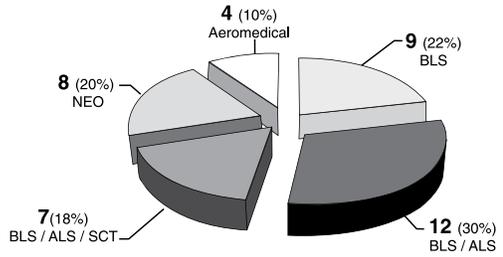
* MCSU = Mass Casualty Support Unit

Commercial Ambulance Services

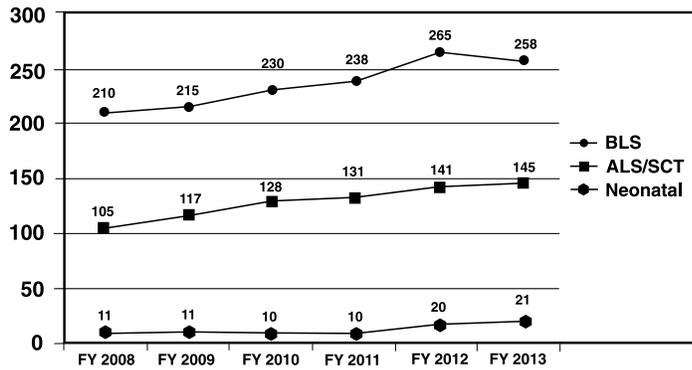
Commercial Ambulance Services (Ground & Air) (FY 2008 - FY 2013)



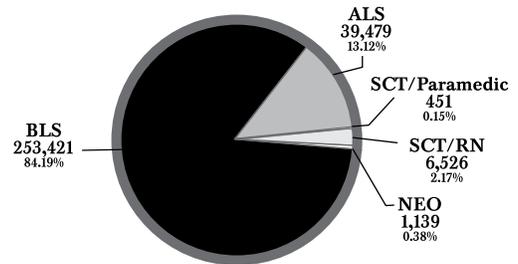
Commercial Services by License Type (FY 2013)



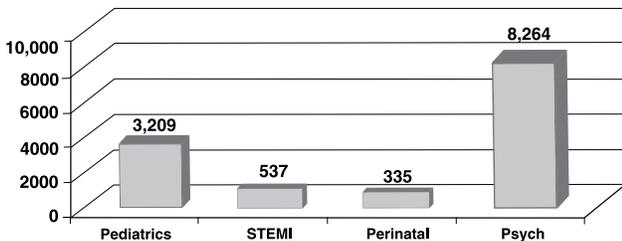
Commercial Ground Ambulance Vehicles by Type (FY 2007 - FY 2012)



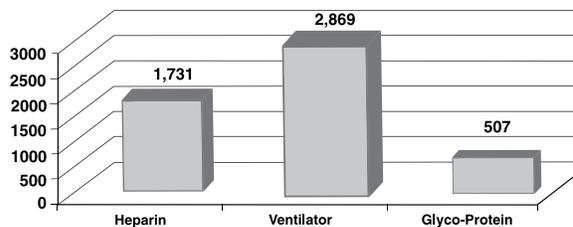
Commercial Ambulance Service Transports (CY 2012)



Transports of Special Populations (CY 2012)



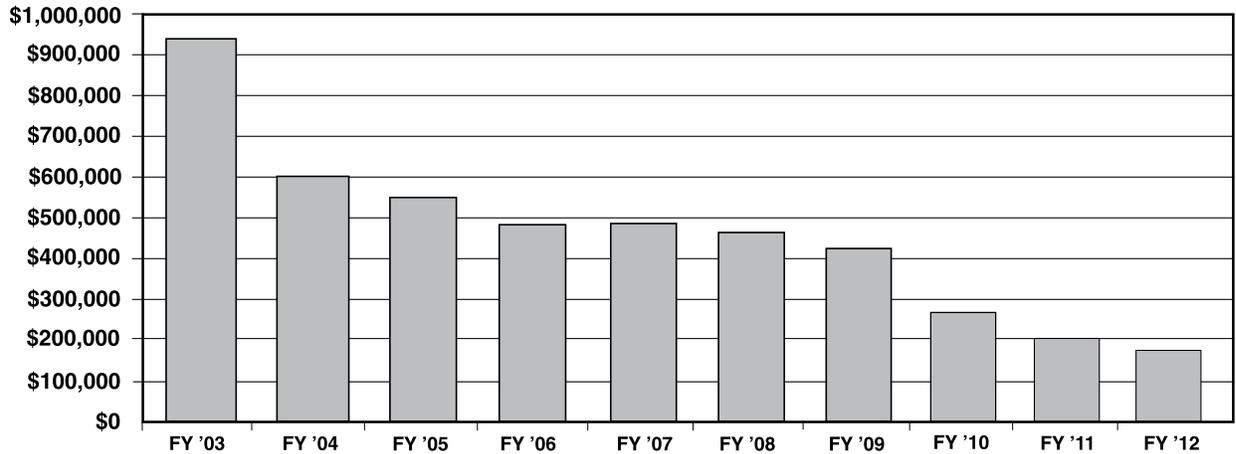
Optional Supplemental Protocols Usage (CY 2012)



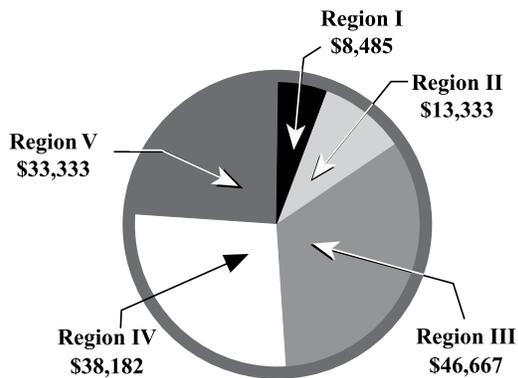
**Health Preparedness Program (HPP)
Bioterrorism Funding for Maryland EMS**

(Federal FY 2003 – FY 2012)

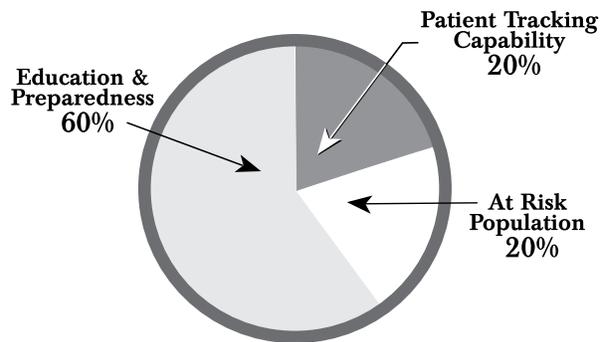
HPP Bioterrorism Funding Totals
(Federal FY 2003 – FY 2012)



**HPP Bioterrorism Funding Allocation
By Maryland EMS Region**
(Federal FY 2012)



HPP Bioterrorism Funding Categories
(Federal FY 2012)



MARYLAND TRAUMA STATISTICS*

Age Distribution of Patients Treated at Pediatric or Adult Trauma Centers

(3-Year Comparison)

Source: Maryland State Trauma Registry

Age Range	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Under 1 year	184	180	182
1 to 4 years	513	553	545
5 to 9 years	465	564	525
10 to 14 years	637	651	678
15 to 24 years	4,860	4,891	4,507
25 to 44 years	6,498	6,761	6,640
45 to 64 years	4,977	5,533	5,318
65+ years	2,775	3,190	3,532
Unknown	21	13	10
TOTAL	20,930	22,336	21,937

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

ADULT TRAUMA

Legend Code

The Johns Hopkins Bayview Medical Center	BVMC	R Adams Cowley Shock Trauma Center	STC
Johns Hopkins Medical System	JHH	Sinai Hospital of Baltimore	SH
Meritus Medical Center	MMC	Suburban Hospital – Johns Hopkins Medicine	SUB
Peninsula Regional Medical Center	PEN	Western Maryland Regional	WMRMC
Prince George's Hospital Center	PGH	Medical Center	

Total Cases Reported by Trauma Centers

(3-Year Comparison)

Source: Maryland State Trauma Registry

Trauma Center	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
The Johns Hopkins Bayview Medical Center	1,504	1,569	1,479
Johns Hopkins Medical System	2,008	2,121	2,129
Meritus Medical Center	953	1,154	996
Peninsula Regional Medical Center	1,181	1,493	1,524
Prince George's Hospital Center	3,069	3,533	3,669
R Adams Cowley Shock Trauma Center	6,659	6,854	6,618
Sinai Hospital of Baltimore	1,767	1,726	1,626
Suburban Hospital – Johns Hopkins Medicine	1,622	1,706	1,572
Western Maryland Regional Medical Center	729	618	734
TOTAL	19,492	20,774	20,347

* Maryland Trauma Statistics are based on patient discharge data from June 2012 to May 2013.

Occurrence of Injury by County: Scene Origin Cases Only

(June 2012 to May 2013)

Source: Maryland State Trauma Registry

County of Injury	Number
Allegany County	406
Anne Arundel County	988
Baltimore County	1,962
Calvert County	151
Caroline County	63
Carroll County	312
Cecil County	78
Charles County	325
Dorchester County	107
Frederick County	321
Garrett County	48
Harford County	495
Howard County	329
Kent County	81
Montgomery County	1,453
Prince George's County	2,403
Queen Anne's County	140
St. Mary's County	175
Somerset County	107
Talbot County	66
Washington County	717
Wicomico County	456
Worcester County	312
Baltimore City	4,807
Virginia	83
West Virginia	166
Pennsylvania	130
Washington, DC	236
Delaware	63
Other	1
Not Indicated	460
TOTAL	17,441

Note: Scene origin cases represent 85.7 % of the total trauma cases treated statewide.

Residence of Patients by County: Scene Origin Cases Only

(June 2012 to May 2013)

Source: Maryland State Trauma Registry

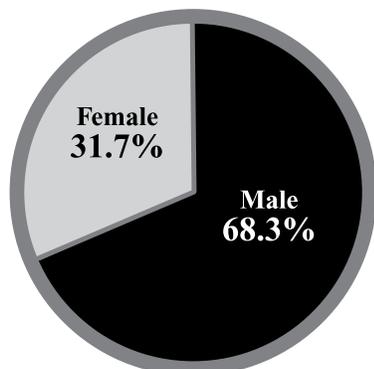
County of Residence	Number
Allegany County	406
Anne Arundel County	966
Baltimore County	2,361
Calvert County	170
Caroline County	67
Carroll County	330
Cecil County	77
Charles County	342
Dorchester County	89
Frederick County	360
Garrett County	32
Harford County	572
Howard County	362
Kent County	64
Montgomery County	1,392
Prince George's County	2,170
Queen Anne's County	112
St. Mary's County	123
Somerset County	83
Talbot County	61
Washington County	592
Wicomico County	417
Worcester County	201
Baltimore City	4,031
Virginia	371
West Virginia	239
Pennsylvania	399
Washington, DC	488
Delaware	165
Other	360
Not Indicated	39
TOTAL	17,441

Note: Scene origin cases represent 85.7 % of the total trauma cases treated statewide.

Gender Profile: Primary Admissions Only

(June 2012 to May 2013)

Source: Maryland State Trauma Registry



Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 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 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
None	22.7%	22.8%	20.5%
Seatbelt	25.8%	24.5%	24.6%
Airbag & Seatbelt	21.8%	23.1%	24.5%
Airbag Only	4.5%	4.2%	4.3%
Infant/Child Seat	0.2%	0.2%	0.2%
Protective Helmet	14.6%	15.1%	14.7%
Padding/Protective Clothing	0.1%	0.1%	0.2%
Other Protective Device	0.1%	0.1%	0.1%
Unknown	10.2%	9.9%	10.9%
TOTAL	100.0%	100.0%	100.0%

Note: Table reflects patients 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 6 hours of emergency department arrival.

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

(June 2012 to May 2013)

Source: Maryland State Trauma Registry

Modality Type	BVMC	JHH	MMC	PEN	PGH	SH	STC	SUB	WMRMC	TOTAL
Ground Ambulance	96.9%	84.5%	82.4%	87.2%	81.2%	95.0%	74.3%	97.2%	80.1%	84.0%
Helicopter	0.0%	0.4%	0.8%	8.7%	13.9%	0.0%	25.0%	0.9%	8.4%	10.7%
Other	3.1%	15.1%	16.8%	4.1%	4.9%	5.0%	0.7%	1.9%	11.5%	5.3%
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 2012 to May 2013)

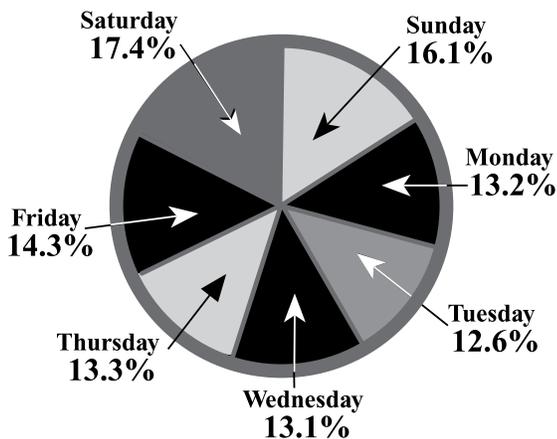
Source: Maryland State Trauma Registry

Origin Type	BVMC	JHH	MMC	PEN	PGH	SH	STC	SUB	WMRMC	TOTAL
Scene of Injury	97.0%	90.9%	98.5%	79.4%	94.7%	98.7%	70.9%	96.9%	95.3%	86.2%
Hospital Transfer	0.2%	6.7%	0.6%	2.0%	1.6%	0.7%	28.9%	1.9%	1.1%	10.9%
Other	2.8%	2.4%	0.9%	18.6%	3.7%	0.6%	0.2%	1.2%	3.6%	2.9%
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 2012 to May 2013)

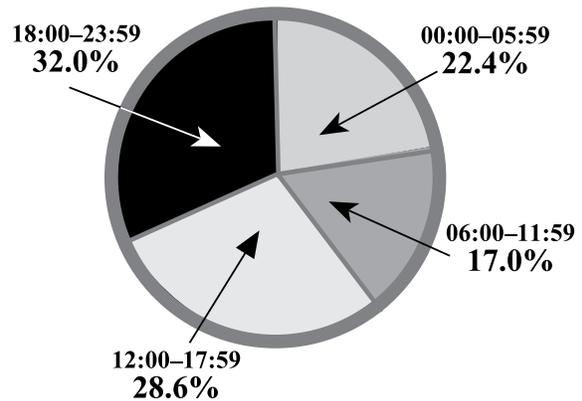
Source: Maryland State Trauma Registry



Emergency Department Arrivals by Time of Day: Primary Admissions Only

(June 2012 to May 2013)

Source: Maryland State Trauma Registry



Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

Number of Deaths by Age

(3-Year Comparison)

Source: Maryland State Trauma Registry

Age	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Under 1 year	0	1	0
1 to 4 years	1	1	2
5 to 14 years	9	3	8
15 to 24 years	150	137	122
25 to 44 years	177	189	185
45 to 64 years	148	158	138
65+ years	184	238	208
Unknown	5	0	1
TOTAL	674	727	664

Deaths Overall as a
Percentage of the Total
Injuries Treated

3.5% 3.5% 3.3%

Note: Only pediatric patients that were treated at adult trauma centers are included in this table. For patients treated at the pediatric trauma centers, see pediatric trauma center tables and graphs.

Number of Injuries by Age

(3-Year Comparison)

Source: Maryland State Trauma Registry

Age	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Under 1 year	42	40	36
1 to 4 years	120	118	121
5 to 14 years	253	291	250
15 to 24 years	4,806	4,828	4,440
25 to 44 years	6,498	6,761	6,640
45 to 64 years	4,977	5,553	5,318
65+ years	2,775	3,190	3,532
Unknown	21	13	10
TOTAL	19,492	20,774	20,347

Note: Only pediatric patients that were treated at adult trauma centers are included in this table. For patients treated at the pediatric trauma centers, see pediatric trauma center tables and graphs.

Number of Injuries and Deaths by Age

(June 2012 to May 2013)

Source: Maryland State Trauma Registry

Age	Number of Injured Patients		Number of Deaths	
	Total	Maryland Residents	Total	Maryland Residents
Under 1 year	36	36	0	0
1 to 4 years	121	93	2	2
5 to 14 years	250	201	8	6
15 to 24 years	4,440	3,922	122	108
25 to 44 years	6,640	5,839	185	168
45 to 64 years	5,318	4,692	138	121
65+ years	3,532	3,190	208	193
Unknown	10	6	1	1
TOTAL	20,347	17,979	664	599

Note: Only pediatric patients that were treated at adult trauma centers are included in this table. For patients treated at the pediatric trauma centers, see pediatric trauma center tables and graphs.

Etiology of Injuries Primary Admissions Only

(3-Year Comparison)

Source: Maryland State Trauma Registry

Etiology	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Motor Vehicle Crash	30.5%	29.8%	28.5%
Motorcycle Crash	6.3%	6.7%	6.0%
Pedestrian Incident	5.0%	5.3%	5.1%
Fall	28.2%	29.9%	32.1%
Gunshot Wound	6.4%	5.2%	5.6%
Stab Wound	6.9%	6.3%	6.2%
Other	16.7%	16.8%	16.5%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

Blood Alcohol Concentration of Patients by Injury Type: Primary Admissions Only

(June 2012 to May 2013)

Source: Maryland State Trauma Registry

Blood Alcohol Concentration	Motor Vehicle Crash	Assault	Fall	Other	Total
Negative	51.5%	41.8%	51.9%	57.4%	50.3%
Positive	30.5%	37.9%	22.9%	18.4%	28.4%
Undetermined	18.0%	20.3%	25.2%	24.2%	21.3%
TOTAL	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 6 hours of emergency department arrival.

Etiology of Injuries by Age: Primary Admissions Only

(June 2012 to May 2013)

Source: Maryland State Trauma Registry

Age	Motor Vehicle Crash	Motorcycle	Pedestrian	Fall	Gunshot Wound	Stab Wound	Other	Total
Under 1 year	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.1%
1 to 4 years	0.2%	0.0%	0.8%	0.6%	0.1%	0.0%	0.9%	0.5%
5 to 14 years	0.4%	0.1%	1.9%	0.4%	0.5%	0.3%	1.5%	0.7%
15 to 24 years	24.8%	21.6%	22.1%	6.4%	40.1%	31.7%	22.3%	19.4%
25 to 44 years	35.9%	40.1%	30.0%	15.5%	46.7%	48.1%	37.0%	30.8%
45 to 64 years	25.3%	35.3%	32.8%	30.8%	11.1%	18.4%	30.0%	27.5%
65+ years	13.4%	2.9%	12.4%	46.1%	1.5%	1.5%	8.3%	21.0%
TOTAL	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 6 hours of emergency department arrival. Only pediatric patients that were treated at adult trauma centers are included in this table. For patients treated at the pediatric trauma centers, see pediatric trauma center tables and graphs.

Etiology Distribution for Patients with Blunt Injuries: Primary Admissions Only

(June 2012 to May 2013)

Source: Maryland State Trauma Registry

Etiology	Percentage
Motor Vehicle Crash	33.1%
Motorcycle Crash	7.0%
Pedestrian Incident	5.9%
Stabbing	0.1%
Fall	37.0%
Other	16.6%
Unknown	0.3%
TOTAL	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

Etiology Distribution for Patients with Penetrating Injuries: Primary Admissions Only

(June 2012 to May 2013)

Source: Maryland State Trauma Registry

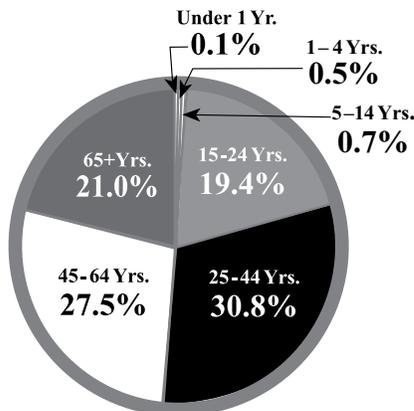
Etiology	Percentage
Motor Vehicle Crash	0.7%
Motorcycle Crash	0.1%
Pedestrian Incident	0.2%
Gunshot Wound	43.1%
Stabbing	47.0%
Fall	1.9%
Other	6.2%
Unknown	0.8%
TOTAL	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

Age Distribution of Patients: Primary Admissions Only

(June 2012 to May 2013)

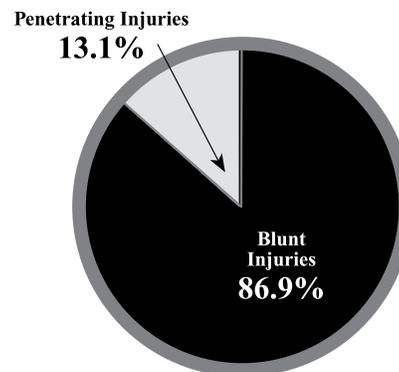
Source: Maryland State Trauma Registry



Injury Type Distribution of Patients: Primary Admissions Only

(June 2012 to May 2013)

Source: Maryland State Trauma Registry



Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival. Only pediatric patients that were treated at adult trauma centers are included in this chart. For patients treated at pediatric trauma centers, see pediatric center tables and graphs.

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

**Final Disposition of Patients:
Primary Admissions Only**

(3-Year Comparison)

Source: Maryland State Trauma Registry

Final Disposition	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Inpatient Rehab Facility	12.7%	13.4%	14.8%
Skilled Nursing Facility	2.1%	2.3%	2.6%
Residential Facility	1.1%	0.5%	0.6%
Specialty Referral Center	3.8%	3.4%	3.9%
Home with Services	2.8%	2.6%	2.7%
Home	67.0%	66.1%	64.2%
Acute Care Hospital	2.4%	2.8%	2.5%
Against Medical Advice	1.7%	2.0%	1.9%
Morgue/Died	4.9%	5.1%	4.7%
Left without Treatment	0.4%	0.3%	0.4%
Hospice Care	0.1%	0.2%	0.3%
Jail	0.8%	1.1%	1.2%
Other	0.2%	0.2%	0.2%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

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

(June 2012 to May 2013)

Source: Maryland State Trauma Registry

ISS	Blunt	Penetrating	Total
1 to 12	70.7%	74.6%	71.3%
13 to 19	15.7%	10.9%	15.1%
20 to 35	11.1%	10.7%	11.0%
36 to 75	2.5%	3.8%	2.6%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 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 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
1 to 12	67.5%	71.5%	74.6%
13 to 19	13.8%	12.2%	10.9%
20 to 35	13.4%	10.8%	10.7%
36 to 75	5.3%	5.5%	3.8%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 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 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
1 to 12	69.4%	70.4%	70.7%
13 to 19	16.8%	15.9%	15.7%
20 to 35	11.1%	11.4%	11.1%
36 to 75	2.7%	2.3%	2.5%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 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 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
1 to 12	69.1%	70.5%	71.3%
13 to 19	16.4%	15.4%	15.1%
20 to 35	11.4%	11.3%	11.0%
36 to 75	3.1%	2.8%	2.6%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

MARYLAND ADULT BURN STATISTICS

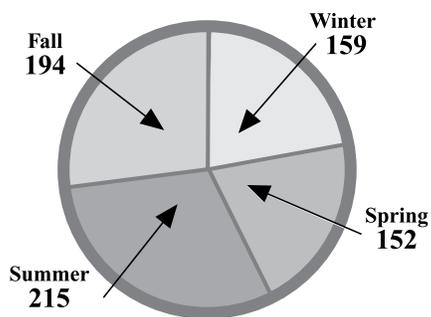
Total Number of Adult Burn Cases

*Patients Age 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
Source: Maryland State Trauma Registry*

Institution	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Johns Hopkins Burn Center at Bayview	612	701	720

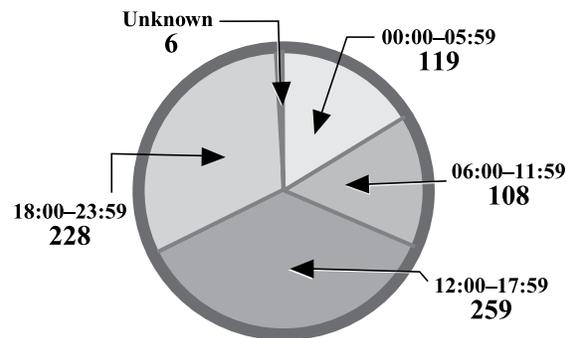
Season of Year Distribution

*Patients Age 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)
Source: Maryland State Trauma Registry*



Time of Arrival Distribution

*Patients Age 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)
Source: Maryland State Trauma Registry*



Place of Injury

*Patients Age 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)
Source: Maryland State Trauma Registry*

Place of Injury	Number
Home	414
Industrial Place	118
Place for Recreation or Sport	75
Street/Highway	43
Public Building	1
Residential Institution	1
Other Specified Place	13
Unspecified Place	55
TOTAL	720

Occurrence of Injury by County

*Patients Age 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)*

Source: Maryland State Trauma Registry

County of Injury	Number
Allegany County	4
Anne Arundel County	70
Baltimore County	156
Calvert County	3
Caroline County	9
Carroll County	21
Cecil County	6
Dorchester County	8
Frederick County	14
Garrett County	1
Harford County	47
Howard County	25
Kent County	1
Montgomery County	10
Prince George's County	7
Queen Anne's County	6
Saint Mary's County	2
Somerset County	2
Talbot County	6
Washington County	8
Wicomico County	10
Worcester County	5
Baltimore City	185
Virginia	11
West Virginia	13
Pennsylvania	24
Washington, DC	2
Delaware	4
Other	5
Not Valued	55
TOTAL	720

Residence of Patients by County

*Patients Age 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)*

Source: Maryland State Trauma Registry

County of Residence	Number
Allegany County	4
Anne Arundel County	72
Baltimore County	168
Calvert County	4
Caroline County	10
Carroll County	26
Cecil County	8
Dorchester County	8
Frederick County	15
Garrett County	1
Harford County	48
Howard County	24
Kent County	1
Montgomery County	11
Prince George's County	10
Queen Anne's County	7
St. Mary's County	2
Somerset County	3
Talbot County	4
Washington County	11
Wicomico County	8
Worcester County	5
Baltimore City	191
Virginia	13
West Virginia	13
Pennsylvania	35
Washington, DC	2
Delaware	8
Other	7
Not Valued	1
TOTAL	720

Mode of Patient Transport

*Patients Age 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)*

Source: Maryland State Trauma Registry

Modality Type	Number
Ground Ambulance	397
Helicopter	57
Other*	251
Not Valued	15
TOTAL	720

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

Etiology of Injury by Age

*Patients Age 15 and Older Treated at Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)*

Source: Maryland State Trauma Registry

Age Range	Electrical	Chemical	Thermal			Inhalation	Other Burn	Other Non-Burn	Unknown	Total
			Flame	Contact	Scald					
15 to 24 years	5	7	61	12	52	1	1	1	0	140
25 to 44 years	14	11	109	16	86	2	2	4	3	247
45 to 64 years	8	20	111	21	77	5	2	5	3	252
65 years and over	0	2	41	7	22	0	0	9	0	81
Total	27	40	322	56	237	8	5	19	6	720

Final Disposition of Patients

*Patients Age 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
(3-Year Comparison)*

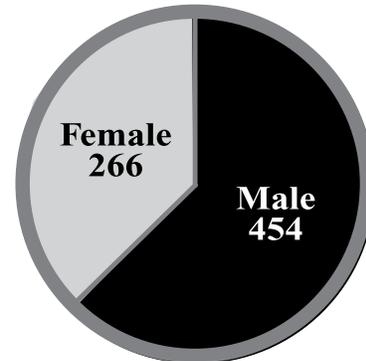
Source: Maryland State Trauma Registry

Final Disposition	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Home	504	559	583
Home with Services	48	51	54
Transfer to Another Acute Care Facility	4	6	9
Discharge to Extended Care Facility	0	0	5
Rehabilitation Facility	11	29	26
Skilled Nursing Facility	11	15	16
Psychiatric Hospital	2	6	2
Morgue/Died	16	12	15
Unable to Complete Treatment	7	8	5
Jail	0	1	0
Not Valued	9	14	5
TOTAL	612	701	720

Gender Profile

*Patients Age 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)*

Source: Maryland State Trauma Registry



Number of Injuries by Age

*Patients Age 15 and Older Treated at
Johns Hopkins Burn Center at Bayview
(3-Year Comparison)*

Source: Maryland State Trauma Registry

Age Range	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
15 to 24 years	119	110	140
25 to 44 years	229	263	247
45 to 64 years	202	247	252
65 years and over	62	81	81
TOTAL	612	701	720

MARYLAND PEDIATRIC TRAUMA STATISTICS

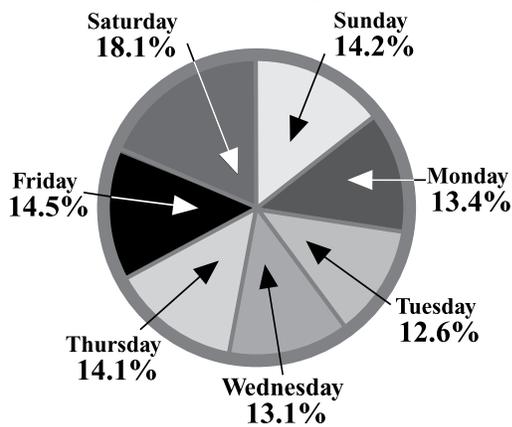
Legend Code	
Children's National Medical Center	CNMC
Johns Hopkins Pediatric Trauma Center	JHP

Total Cases Treated at Pediatric Trauma Centers (3-Year Comparison)			
Trauma Center	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
CNMC	765	862	759
JHP	673	700	831
TOTAL	1,438	1,562	1,590

Note: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center 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.

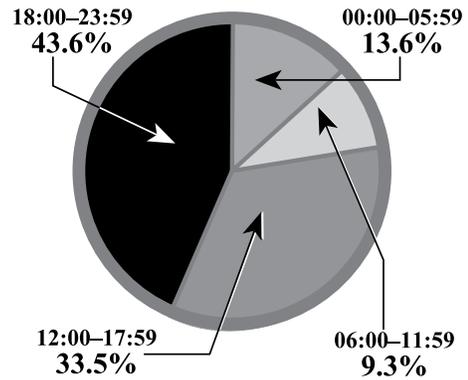
Emergency Department Arrivals by Day of Week: Children Treated at Pediatric Trauma Centers

(June 2012 to May 2013)



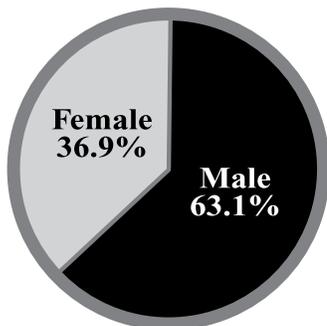
Emergency Department Arrivals by Time of Day: Children Treated at Pediatric Trauma Centers

(June 2012 to May 2013)



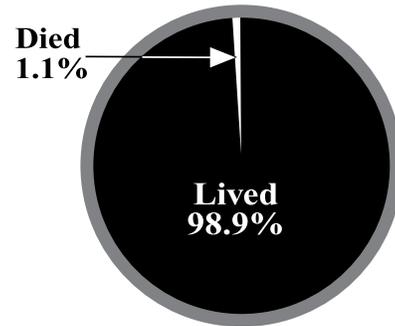
Gender Profile: Children Treated at Pediatric Trauma Centers

(June 2012 to May 2013)



Outcome Profile: Children Treated at Pediatric Trauma Centers

(June 2012 to May 2013)



Note: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center 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 2012 to May 2013)*

Modality Type	CNMC	JHP	Total
Ground Ambulance	59.5%	73.1%	67.9%
Helicopter	19.8%	19.5%	19.6%
Other	20.7%	7.4%	12.5%
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 Report. Children's National Medical Center 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.

Origin of Patient Transport by Center

*Children Treated at Pediatric Trauma Centers
(June 2012 to May 2013)*

Origin	CNMC	JHP	Total
Scene of Injury	46.6%	67.9%	57.7%
Hospital Transfer	41.6%	31.4%	36.3%
Other	11.8%	0.7%	6.0%
TOTAL	100.0%	100.0%	100.0%

Note: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center 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.

Injury Type

*Children Treated at Pediatric Trauma Centers
(3-Year Comparison)*

Injury Type	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Blunt	95.5%	94.4%	93.5%
Penetrating	2.9%	3.0%	2.4%
Near Drowning	0.4%	1.0%	0.8%
Hanging	0.3%	0.2%	0.3%
Ingestion	0.2%	0.0%	0.1%
Crush	0.1%	0.3%	0.3%
Animal Bite/Human Bite	0.6%	1.0%	2.6%
Other	0.0%	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 Report. Children's National Medical Center 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.

Etiology of Injuries

*Children Treated at Pediatric Trauma Centers
(3-Year Comparison)*

Etiology	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Motor Vehicle Crash	16.4%	17.1%	14.9%
Motorcycle Crash	1.1%	0.8%	0.8%
Pedestrian Incident	9.4%	9.4%	9.3%
Gunshot Wound	1.2%	0.9%	0.8%
Stabbing*	1.4%	2.0%	2.3%
Fall	43.0%	41.7%	42.9%
Other	27.5%	28.1%	29.0%
TOTAL	100.0%	100.0%	100.0%

Note: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center 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.

**Stab wounds include both intentional and unintentional piercings and punctures.*

Etiology of Injuries by Age

Children Treated at Pediatric Trauma Centers (June 2012 to May 2013)

Age	Motor Vehicle Crash	Motorcycle	Pedestrian	Fall	Gunshot Wound	Stab Wound*	Other	Total
Under 1 year	2.1%	0.0%	0.0%	14.3%	0.0%	5.6%	8.7%	9.2%
1 to 4 years	28.5%	8.3%	19.7%	34.5%	38.5%	19.4%	17.7%	26.8%
5 to 9 years	27.7%	25.0%	39.5%	29.0%	15.4%	27.8%	22.5%	27.7%
10 to 14 years	37.0%	58.4%	38.1%	19.5%	46.1%	33.3%	45.2%	32.1%
15+ years	4.7%	8.3%	2.7%	2.7%	0.0%	13.9%	5.9%	4.2%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center 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.

**Stab wounds include both intentional and unintentional piercings and punctures.*

Number of Injuries and Deaths by Age

Children Treated at Pediatric Trauma Centers
(June 2012 to May 2013)

Age	Number of Injured Patients		Number of Deaths	
	Total	Maryland Residents	Total	Maryland Residents
Under 1 year	146	138	2	2
1 to 4 years	424	408	8	8
5 to 9 years	439	418	4	4
10 to 14 years	514	487	3	3
15+ years	67	65	1	1
TOTAL	1,590	1,516	18	18

Note: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center 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.

Number of Injuries by Age

Children Treated at Pediatric Trauma Centers
(3-Year Comparison)

Age	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Under 1 year	142	140	146
1 to 4 years	393	435	424
5 to 9 years	373	451	439
10 to 14 years	476	473	514
15+ years	54	63	67
TOTAL	1,438	1,562	1,590

Note: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center 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.

Number of Deaths by Age

Children Treated at Pediatric Trauma Centers
(3-Year Comparison)

Age	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Under 1 year	2	3	2
1 to 4 years	3	7	8
5 to 9 years	5	5	4
10 to 14 years	7	2	3
15+ years	1	0	1
TOTAL	18	17	18

Note: For children that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center 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.

Final Disposition of Patients

Children Treated at Pediatric Trauma Centers
(3-Year Comparison)

Final Disposition	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
Inpatient Rehab Facility	2.8%	2.5%	3.2%
Residential Facility	0.2%	0.4%	0.1%
Specialty Referral Center	0.0%	0.1%	0.1%
Home with Services	1.0%	1.5%	0.9%
Home	94.1%	92.9%	92.6%
Acute Care Hospital	0.0%	0.3%	0.2%
Morgue/Died	1.2%	1.1%	1.1%
Foster Care	0.7%	1.2%	1.6%
Jail	0.0%	0.0%	0.1%
Other	0.0%	0.0%	0.1%
TOTAL	100.0%	100.0%	100.0%

Note: For children that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center 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.

Etiology of Injuries by Age

Children Treated at Pediatric Trauma Centers or Adult Trauma Centers (June 2012 to May 2013)

Age	Motor Vehicle		Pedestrian	Fall	Gunshot Wound	Stab Wound*	Other	Total
	Crash	Motorcycle						
Under 1 year	3.0%	0.0%	0.0%	15.8%	0.0%	5.6%	7.9%	9.3%
1 to 4 years	26.6%	5.3%	19.8%	37.3%	30.0%	19.4%	20.8%	28.5%
5 to 9 years	28.4%	21.0%	39.6%	27.4%	20.0%	27.8%	22.5%	27.2%
10 to 14 years	42.0%	73.7%	40.6%	19.5%	50.0%	47.2%	48.8%	35.0%
TOTAL	100.0%							

Notes: Children's National Medical Center 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.

*Stab wounds include both intentional and unintentional piercings and punctures.

Occurrence of Injury by County: Scene Origin Cases Only

*Children Treated at Pediatric Trauma Centers
(June 2012 to May 2013)*

County of Injury	Number
Anne Arundel County	67
Baltimore County	121
Calvert County	14
Caroline County	10
Carroll County	21
Cecil County	14
Charles County	21
Dorchester County	6
Frederick County	23
Harford County	43
Howard County	26
Kent County	8
Montgomery County	65
Prince George's County	201
Queen Anne's County	14
St. Mary's County	22
Somerset County	1
Talbot County	6
Washington County	8
Worcester County	1
Baltimore City	202
Virginia	3
Washington, DC	14
Not Indicated	5
TOTAL	916

Notes: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland. Scene origin cases represent 57.6% of the total cases treated at pediatric trauma centers. For children that 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 2012 to May 2013)*

County of Residence	Number
Anne Arundel County	62
Baltimore County	127
Calvert County	15
Caroline County	8
Carroll County	20
Cecil County	11
Charles County	23
Dorchester County	6
Frederick County	21
Garrett County	1
Harford County	40
Howard County	24
Kent County	8
Montgomery County	72
Prince George's County	186
Queen Anne's County	10
St. Mary's County	22
Somerset County	1
Talbot County	6
Washington County	8
Baltimore City	194
Virginia	5
Pennsylvania	11
Washington, DC	19
Delaware	2
Other	14
TOTAL	916

Notes: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland. Scene origin cases represent 57.6% of the total cases treated at pediatric trauma centers. For children that 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)*

Protective Device	June 2010 to May 2011	June 2011 to May 2012	June 2012 to May 2013
None	35.8%	34.4%	40.2%
Seatbelt	18.9%	21.0%	20.7%
Airbag & Seatbelt	3.0%	0.8%	3.5%
Airbag Only	0.0%	0.0%	0.8%
Infant/Child Seat	17.7%	21.5%	11.9%
Protective Helmet	10.5%	13.2%	9.7%
Other Protective Device	0.0%	0.5%	0.0%
Padding/Protective Clothing	0.0%	0.3%	0.0%
Unknown	14.1%	8.3%	13.2%
TOTAL	100.0%	100.0%	100.0%

Note: Table reflects children involved in motor vehicle, motorcycle, bicycle, and sports-related incidents only. For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center 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.

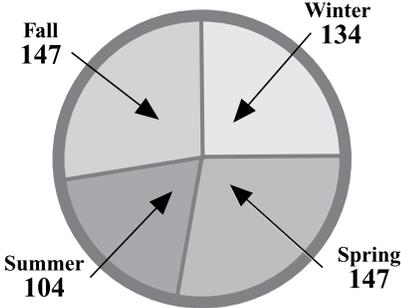
MARYLAND PEDIATRIC BURN STATISTICS

Legend Code	
Children's National Medical Center	CNMC
Johns Hopkins Pediatric Trauma Center	JHP
Johns Hopkins Burn Center at Bayview	JHBC

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 (June 2012 to May 2013)
 Source: Maryland State Trauma Registry

Institution	Legend Code	Number
Children's National Medical Center Pediatric Burn Center	CNMCBC	240
Johns Hopkins Pediatric Burn Center	JHPBC	279
Johns Hopkins Burn Center at Bayview	JHBC	13
TOTAL		532

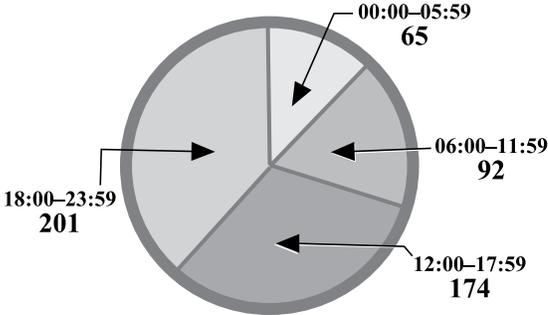
Season of Year Distribution
Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2012 to May 2013)
 Source: Maryland State Trauma Registry



Place of Injury
Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15 Treated at Johns Hopkins Burn Center at Bayview (June 2012 to May 2013)
 Source: Maryland State Trauma Registry

Place of Injury	Number
Home	468
Farm	2
Place for Recreation or Sport	10
Street/Highway	4
Public Building	14
Other Specified Place	14
Unspecified Place	20
TOTAL	532

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 2012 to May 2013)
 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 2012 to May 2013)

Source: Maryland State Trauma Registry

County of Injury	Number
Allegany County	1
Anne Arundel County	25
Baltimore County	39
Calvert County	10
Carroll County	6
Cecil County	2
Charles County	8
Dorchester County	1
Frederick County	10
Harford County	11
Howard County	13
Kent County	2
Montgomery County	71
Prince George's County	129
Queen Anne's County	1
St. Mary's County	9
Somerset County	2
Talbot County	2
Washington County	5
Wicomico County	5
Worcester County	2
Baltimore City	132
Virginia	3
West Virginia	4
Pennsylvania	8
Other	1
Not Valued	30
TOTAL	532

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 2012 to May 2013)

Source: Maryland State Trauma Registry

County of Residence	Number
Allegany County	1
Anne Arundel County	24
Baltimore County	42
Calvert County	10
Carroll County	6
Cecil County	2
Charles County	8
Dorchester County	1
Frederick County	10
Harford County	12
Howard County	15
Montgomery County	69
Prince George's County	130
Queen Anne's County	1
St. Mary's County	10
Somerset County	2
Talbot County	2
Washington County	6
Wicomico County	7
Baltimore City	147
Virginia	4
West Virginia	4
Pennsylvania	11
Washington, DC	1
Delaware	1
Other	5
Not Valued	1
TOTAL	532

Mode 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 2012 to May 2013)

Source: Maryland State Trauma Registry

Modality Type	CNMCBC	JHPBC	JHBC	Total
Ground Ambulance	99	159	0	258
Helicopter	9	18	0	27
Other*	132	95	12	239
Not Valued	0	7	1	8
TOTAL	240	279	13	532

Note: The category "Other" includes patients that 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 2012 to May 2013)

Source: Maryland State Trauma Registry

Origin Type	CNMCBC	JHPBC	JHBC	Total
Scene of Injury	179	186	12	377
Hospital Transfer	61	93	0	154
Not Valued	0	0	1	1
TOTAL	240	279	13	532

Etiology of Injuries by Age

*Patients Treated at Pediatric Burn Centers and Patients Less Than Age 15
Treated at Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)*

Source: Maryland State Trauma Registry

Age Range	Electrical	Chemical	Thermal			Inhalation	Other Burn	Other Non-Burn	Unknown	Total
			Flame	Contact	Scald					
Under 1 year	0	1	0	28	46	0	1	0	2	78
1 to 4 years	4	4	11	72	175	3	0	3	9	281
5 to 9 years	7	1	18	12	69	0	0	0	3	110
10 to 14 years	1	2	20	7	23	1	0	0	1	55
15 years and over	0	0	2	1	4	0	0	0	1	8
Total	12	8	51	120	317	4	1	3	16	532

Final Disposition of Patients

*Patients Treated at Pediatric Burn Centers and
Patients Less Than Age 15 Treated at
Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)*

Source: Maryland State Trauma Registry

Final Disposition	Number
Home	487
Home with Services	18
Transfer to an Acute Care Facility	7
Rehabilitation Facility	5
Morgue/Died	3
Alternative Caregiver	7
Foster Care	4
Transfer to Inpatient Psychiatric Facility	1
TOTAL	532

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 2012 to May 2013)*

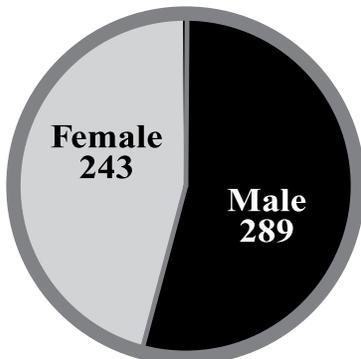
Source: Maryland State Trauma Registry

Length of Stay	Less Than 10% TBSA	10 - 19% TBSA	20% or Greater TBSA	Not Valued	Total
1 Day	385	10	1	46	442
2 - 3 Days	35	3	0	10	48
4 - 7 Days	9	5	0	0	14
8 - 14 Days	11	6	0	2	19
15 - 21 Days	1	3	1	1	6
22 - 28 Days	0	1	1	0	2
Over 28 Days	0	0	0	1	1
TOTAL	441	28	3	60	532

Gender Profile

*Patients Treated at Pediatric Burn Centers and
Patients Less Than Age 15 Treated at
Johns Hopkins Burn Center at Bayview
(June 2012 to May 2013)*

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
(June 2012 to May 2013)*

Source: Maryland State Trauma Registry

Age Range	Number
Under 1 year	78
1 to 4 years	281
5 to 9 years	110
10 to 14 years	55
15 years and over	8
TOTAL	532

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

(June 2012 to May 2013)

Source: Maryland State Trauma Registry

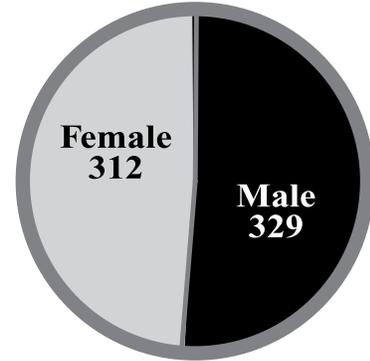
Age Range	Number
Under 1 year	81
1 to 4 years	333
5 to 9 years	135
10 to 14 years	73
15 years and over	19
TOTAL	641

**Note: During the above time period, there were 1,336 total pediatric burn clinic visits. Of these, 641 were unique patients.*

Gender Profile

Patients Treated at the Pediatric Burn Clinics at the Johns Hopkins Pediatric Center and Children's National Medical Center (May 2012 to June 2013)

Source: Maryland State Trauma Registry



Etiology of Injury by Age

Patients Treated at the Pediatric Burn Clinics At Johns Hopkins Pediatric Center and Children's National Medical Center (June 2012 to May 2013)

Source: Maryland State Trauma Registry

Age Range	Electrical	Chemical	Thermal			Other Burn	Other Non-Burn	Unknown	Total
			Flame	Contact	Scald				
Under 1 year	0	1	0	35	43	1	0	1	81
1 to 4 years	5	0	12	112	195	0	2	7	333
5 to 9 years	6	1	10	26	90	0	0	2	135
10 to 14 years	1	3	13	12	39	4	0	1	73
15 years and over	1	0	1	4	12	1	0	0	19
Total	13	5	36	189	379	6	2	11	641

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

In 2007, in an effort to further basic, translational, and clinical studies in injury research, the University of Maryland School of Medicine (UMSOM) designated its Charles “McC.” Mathias, Jr., National Study Center for Trauma and EMS as an Organized Research Center (ORC). Since this designation, the Shock, Trauma, and Anesthesiology Research—Organized Research Center (STAR-ORC) is rapidly becoming a world-class, multidisciplinary research and educational center focusing on brain injuries, critical care and organ support, resuscitation, surgical outcomes, patient safety, and injury prevention. The STAR-ORC encompasses the research activities of the UMSOM’s Program in Trauma and its Department of Anesthesiology, along with the existing National Study Center (NSC), which was established in 1986 by the US Congress. The STAR-ORC is led by Alan I. Faden, MD, David S. Brown Professor of Trauma and Professor of Anesthesiology, University of Maryland School of Medicine. The Executive Committee of the STAR-ORC is comprised of Dr. Faden; Thomas M. Scalea, MD, FACS, FCCM, Physician-in-Chief, R Adams Cowley Shock Trauma Center, System Chief for Critical Care Services, University of Maryland Medical System, and Francis X. Kelly Professor of Trauma Surgery, Director, Program in Trauma; and Peter Rock, MD, MBA, Martin Helrich Professor and Chair, Department of Anesthesiology.

Research Activities

Motor Vehicle-Related Injuries: The NSC is a leading participant in two multicenter studies of injuries sustained in vehicular crashes: the Crash Injury Research and Engineering Network (CIREN) and the Crash Outcome Data Evaluation System (CODES) Data Network funded by the National Highway Traffic Safety Administration (NHTSA). The NSC is one of six centers awarded the CIREN project on an annually renewable basis, currently funded through 2015. During the 2012-2013 contract year, 65 cases were enrolled into CIREN. Case reviews were held each month and the NSC hosted NHTSA administrators on several occasions; the meetings have also been attended by representatives from the automotive industry and from other CIREN centers. The NSC’s CIREN center continued partnerships with the following agencies/organizations: Johns Hopkins University Applied Physics Lab, Maryland State Police, Baltimore County Police Department, Office of the Chief Medical Examiner, Maryland Motor Vehicle Administration, and the Maryland Highway Safety

Office (MHSO). CIREN cases are frequently used as part of biomechanics presentations at the R Adams Cowley Shock Trauma Center and other local injury prevention programs across the state. CIREN team members presented “Major Vascular Injuries in MVCs: Increased Risk or Better Detection?” at the CIREN Annual Meeting at NHTSA Headquarters in September 2012. Additionally, the NSC began collaborating with MIEMSS on a CIREN-funded project to improve the collection and use of Advanced Automatic Collision Notification data.

As part of CODES, the NSC has compiled information from a variety of statewide databases to allow for in-depth analysis of highway safety programs. During the past year, the Maryland CODES team has continued as the Program Resource Center (PRC) for the national CODES data network. The PRC, in conjunction with the Technical Resource Center at the University of Utah, provides coordination and support for the 17 states currently participating in the program. On state and local levels, data provided by the Maryland CODES program are used for portions of the Highway Safety Plan and Annual Report compiled by the MHSO and to support a variety of problem identification and program evaluation activities across the state. NSC staff members serve on the Traffic Records Coordinating Committee, the Strategic Highway Safety Plan Implementation and Emphasis Area Teams, the National Traffic Records Advisory Committee, the Association of Transportation Safety Information Professionals Executive Board, and Maryland’s Partnership for a Safer Maryland. The PRC coordinates the NHTSA CODES Grand Rounds Electronic Seminars.

Under a contract with the MHSO, the NSC serves as a key data analysis partner for the MHSO and the Maryland Motor Vehicle Administration. During the past year, NSC staff has conducted analyses related to nighttime seatbelt use, motorcycle safety, older drivers, and distracted driving. The NSC presented Maryland crash data to the Maryland General Assembly at the beginning of its legislative session in January 2013 and used new NHTSA guidelines to revise the Maryland Seat Belt Survey for 2012. The survey was conducted in the summer of 2012; within 14 sampled jurisdictions, 37,469 motor vehicles (i.e., passenger cars, sport utility vehicles, and pick-up trucks) with 45,055 front seat occupants were observed. The overall seat belt usage rate for all drivers and front seat passengers, weighted by probability of roadway selection and jurisdictional roadway-specific vehicle miles traveled, was 91.1%. The overall weighted standard error rate was



well below the 2.5% threshold required by NHTSA. Further subgroup analyses of observed seat belt usage were presented to the MHSO according to jurisdiction, roadway type, and driver cell phone usage.

In addition to the core data available to the NSC through their CODES initiative, the NSC also realizes that understanding behaviors of drivers is critical information that can help to explain changes (or lack thereof) in crashes and injuries. Staff developed what has come to be known as the Action Measure Tools and the Maryland Annual Driving Survey (MADS). These surveys were designed to learn more about what motivates survey respondents, what is important to them, and if they understand some of Maryland's traffic safety laws. Outputs are shared continually throughout the year with MHSO staff. Through the 2012 MADS, researchers sought to identify individuals who engage in risky driving behaviors through the inclusion of specific behaviorally defined questions. Among the aims of the study were to examine the association between how individuals respond to risk-taking behavioral questions and other traffic-related behavioral questions and to determine possible differences between those identified as having high, moderate, or low risk behaviors. Results of the survey indicated that, overall, high and moderate risk respondents were more likely than low risk respondents to report "riskier" behavior for all questions. Young males scored higher on the risk-taking questions, but, regardless of gender, risk-taking declined with increasing age. This information will be helpful for the MHSO to develop programs and direct activities towards risk-taking individuals.

The NSC is continuing its collaborative efforts with other State agencies to make highway safety data available to the public, via the internet, in the form of canned reports and queries. Many of these products, including a data request form, were made available

through the NSC webpage (medschool.umaryland.edu/orc_trauma_anes/data_request.asp). The NSC staff is also playing a critical role in the state's Strategic Highway Safety Plan Implementation and Emphasis Area Teams by serving as Data Coordinator for all partners in the plan.

NSC staff also attended and presented at the Traffic Records Forum, the American Association for the Surgery of Trauma, Lifesavers, and State Motorcycle Safety Administrators Annual Conferences. Topics for presentation included an analysis of data collected through the DriveCam[®] project, younger drivers, an evaluation of crash and citation risk among newly licensed drivers, and motorcycle safety.

Alcohol Related Injuries: The NSC has two grants funded by the National Institutes of Health (NIH) to study the role that alcohol use and alcohol hangovers play in trauma and subsequent mortality. The first project, "Alcohol Involvement in a Cohort of Trauma Patients: Trends and Future Mortality," is innovative because it links unique longitudinal data on alcohol consumption by R Adams Cowley Shock Trauma Center patients with National Death Index data to identify patients who die after discharge. The objective of this study is to develop a comprehensive toxicology database on alcohol involvement in non-fatal injuries, spanning 1983 to the present, use this data to evaluate trends in alcohol involvement in non-fatal injuries over time, and determine how an elevated blood alcohol concentration (BAC) on admission relates to subsequent mortality risk. The underlying hypothesis is that patients with a BAC above a certain level, which has yet to be determined, have such a high risk of dying of another injury that treatment for their problem drinking is a medical necessity.

The second project, "Hangovers and Traffic Injuries: Is Alcohol's Influence Greater Than Expected?" will identify and quantify the role of residual effects of alcohol in traffic injuries by assessing biomarkers of recent alcohol consumption in motor vehicle crash drivers admitted to the Shock Trauma Center. The study includes collecting urine samples from participants to evaluate biomarkers of recent alcohol consumption. Each of the two grants is awarded for five years, and together they represent over \$4.7 million in funding.

Prehospital and In-Hospital Care: Two studies sponsored by the US Department of Defense are underway to collect and analyze continuous vital signs data in trauma patients, both in prehospital and on arrival at

the Shock Trauma Center, for one hour of resuscitation. The objective is to develop predictive algorithms based on collected vital signs data, patient outcomes, and therapeutic interventions between field encounter and completion of resuscitation. More than 1,000 patient data points have been collected. Automated (no user input) predictions of blood use fewer than three hours, using only pulse oximeter signal processing, are 97% accurate. The project has developed prototype decision aids for military and civilian prehospital providers that are being tested to predict transfusion and emergency surgery needs before hospital arrival.

Retention and Assessment of Surgical Performance Study: A study funded by the US Army is assessing surgical skill retention in vascular control procedures in cadaver and simulated physical models. The study will use performance assessments to measure before and after training changes and determine how long the training effects persist before re-training maybe required.

Training Activities

Within the United States, the National Study Center actively trains epidemiologists and other health professionals to research topics related to injuries and emergency medical services. Currently, there are five epidemiology doctoral students working with NSC faculty to develop research projects as part of their training. Four of these students are at the stage of preparing their dissertations.

Internationally, continued funding by the Fogarty International Center of the NIH through their International Collaborative Trauma and Injury Research Training Program has provided training in the United States and the Middle East for health professionals in a number of injury prevention and response-related courses. The material covered in these various courses includes injury epidemiology and biostatistics, emergency preparedness and disaster response, and the clinical care of trauma patients. As a key component of this grant, five Egyptian physician trainees came to the United States during June and July of 2007 to increase their knowledge and understanding of injury-related research through classroom training and completion of a research assignment. Four additional Egyptian physicians were trained during June and July of 2008, four were trained in 2009, five Egyptian physicians and two Kenyan health professionals were trained in 2012. These students

returned to their respective countries and are now applying their new knowledge through research projects to decrease significant injury-related morbidity and mortality. Ten physicians from the Middle East are scheduled for the course in 2013. Through this grant approximately 800 trainees from countries in the Middle East, including Egypt, Iraq, Sudan, Palestine, Saudi Arabia, Syria, Yemen, Pakistan, Iran, Oman, and Afghanistan, have participated in one or more of the training courses. Overall, these courses are designed to strengthen injury prevention and control research and practice within Egypt and the Eastern Mediterranean region.

MIEMSS-NSC Memorandum of Understanding

Through a cooperative Memorandum of Understanding agreement, the NSC continues to support data management and data analysis needs as requested by MIEMSS. The focus of the past year has been on the development of standardized procedures and documents for analysis of data trends from previous years. Ongoing activities include targeted data analysis efforts and assisting with updating data security and access policies and procedures. NSC is also supporting the future development and trending of EMS performance metrics.

Additionally, the Maryland Emergency Medical Services Research Interest Group was developed with members from MIEMSS, University of Maryland, and Johns Hopkins University. The purpose of this group, which meets monthly, is to help further EMS research within Maryland and nationally. This past year, the group submitted one publication and had three abstracts accepted for presentation at national academic meetings. The group is working to turn each abstract into a publication. NSC members continue to serve on various MIEMSS committees and provide assistance to meet the mission and the vision of MIEMSS.

In addition to in-house preparation of peer-reviewed research papers, NSC staff also offers manuscript preparation support (including technical writing, research design, and data analysis) for university, hospital, and trauma center researchers. NSC staff members were instrumental in the publication of at least 15 manuscripts by University of Maryland, Baltimore researchers between June 2012 and May 2013, with five to ten additional papers still in various stages of critical review.

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