



# Maryland Institute for Emergency Medical Services Systems



2005-2006  
Annual Report



# MIEMSS: MISSION/VISION/KEY GOALS

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.

## MISSION

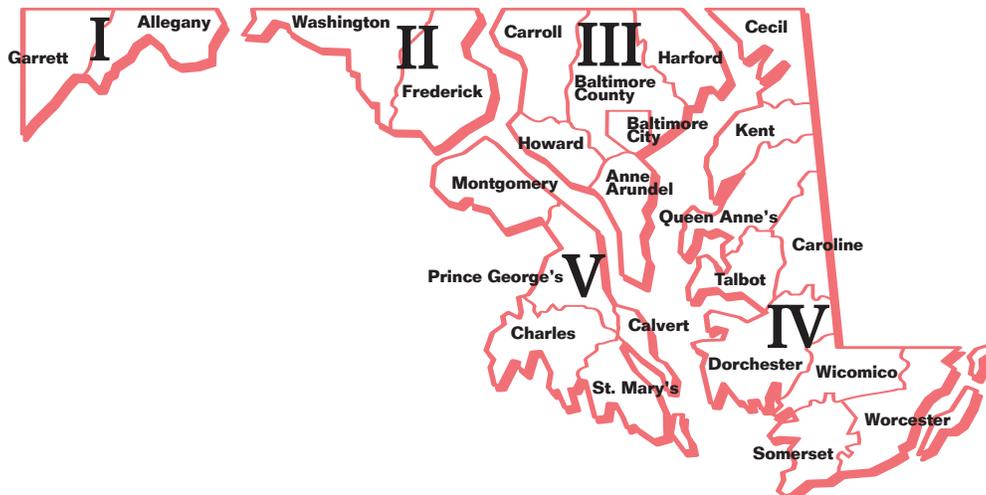
Consistent with Maryland law and guided by the EMS Plan, to provide the resources (communications, infrastructure, grants, and training), leadership (vision, expertise, and coordination), and oversight (medical, regulatory, and administrative) necessary for Maryland's statewide emergency medical services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



# 2005–2006 ANNUAL REPORT

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Current Listing of EMS Board, Statewide EMS Advisory Council,  
and MIEMSS Executive Staff

inside back cover

# FROM THE EMS BOARD CHAIRMAN



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

**B**y instant news coverage, increased mobility, and modern technology, our world continues to shrink. Yet rifts between people of different lands, different religions, and different backgrounds grow larger. The rhetoric and violence emanating as a result are also escalating, and the breadth and availability of tools of destruction raise the stakes. Economic pressures and the stresses of modern day life in our own communities lead to more violent behavior and turbulent events. Seemingly, the environment is heating up too, which when combined with growing populations and urbanization is

increasing the impact of weather disturbances. Last year was marked by severe storms in Gulf regions of the United States with unprecedented damage. We may not know where or when the next disaster, man-made or nature-driven, will hit, but it is becoming clear that each year will bring unique and unprecedented challenges to the fire and EMS communities. Whereas EMS was once principally involved with response to medical emergencies arising from illness and accidents, its responsibilities in today's world are larger and more varied as they evolve in the post-9/11 era.

The challenge for emergency medical services systems is to be prepared as best we can, to learn from the past and plan for the future. We must prepare ourselves to expect the unexpected, to ponder the once unthinkable. The Emergency Medical Services Board hopes to help lead EMS into the future by encouraging and supporting new initiatives, ensuring that appropriate resources are available for state and local EMS, and enhancing the use of the resources in hand. The Board, the staff of the Maryland Institute for Emergency Medical Services Systems, and each colleague in EMS at the federal, state, and local level must dedicate themselves to meeting these challenges, cooperating and strengthening the relationships that bind our mutual goals and objectives. We look forward to facing the challenges together with you in the coming years.



# MIEMSS

## FROM THE EXECUTIVE DIRECTOR



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

Over the past year, MIEMSS has been involved in state and national planning efforts that will build on our past successes and lay the groundwork for meeting the future needs and challenges to the Maryland EMS System. The current statewide EMS System in Maryland is unique in the nation and recognized as a model for others to emulate in the recently released Institute of Medicine report (see below). Throughout Maryland, there exists one seamless emergency medical services system that incorporates all components necessary to respond to emergency care needs. This uniform approach to emergency medical services throughout the State helps ensure that the highest level of emergency care is available to respond to each patient care emergency.

Despite being a national leader in emergency medical services, our statewide emergency medical system will face significant challenges in the future. These challenges are not unique to Maryland; rather they affect the entire nation. During the past year, the National Academy of Sciences' Institute of

Medicine's (IOM) completed its three-year examination of emergency care in the U.S. In 2003, the IOM convened a Committee on the Future of Emergency Care in the United States Health System to examine the state of emergency care in the U.S.; to create a vision for the future of emergency care, including trauma care; and to make recommendations to help the nation achieve that vision. The Committee released its findings and recommendations in June 2006 in three reports that can be downloaded from the internet: (1) *Hospital-Based Emergency Care: At the Breaking Point* explores the changing role of the hospital emergency department and describes the national epidemic of overcrowded emergency departments and trauma centers; (2) *Emergency Medical Services at the Crossroads* describes the development of Emergency Medical Services (EMS) systems over the last 40 years and the fragmented system that exists today; and (3) *Emergency Care for Children: Growing Pains* describes the unique challenges of emergency care for children.

Key findings from the three reports include that: (1) emergency departments are overcrowded, and unless hospitals address this issue, back-ups in both the emergency department and prehospital EMS environments will continue; (2) there are multiple EMS jurisdictions throughout the U.S. where improvements are needed in key areas, such as communications; (3) federal responsibility for emergency care is fragmented and involves several different federal agencies; and (4) there is an increased unavailability of specialists due to inadequate compensation and increased liability exposure.

IOM reports' recommendations included: (1) creation of a coordinated, regionalized, accountable system to ensure seamless emergency and trauma services for the patient; (2) federal government support for the development of national standards for emergency care performance measurement, categorization of all emergency care facilities, and protocols for the treatment, triage, and transport of pre-

hospital patients; (3) federal government consolidation of functions related to emergency care that are currently scattered among multiple agencies into a single agency in the Department of Health and Human Services (DHHS); (4) ending hospital emergency department and ambulance diversion by improving hospital efficiency and patient flow and ensuring greater involvement by the Joint Commission on the Accreditation of Healthcare Organizations and the Centers for Medicare and Medicaid Services; and (5) increasing federal funding for emergency care, including the federal Emergency Medical Services for Children Program.

In order to ensure that Maryland's EMS System is able to respond to these and other challenges, the EMS Board and the Statewide EMS Advisory Council approved a revised and updated Statewide EMS Plan in September 2006. The revised and updated Statewide EMS Plan builds upon the original plan, developed in 1994–1995 that contained 99 objectives organized according to the national "EMS components" that had been identified in the mid-1970s. Although the original plan had been updated in 2000 and 2003, a review by the National Highway Traffic Safety Administration of Maryland's EMS System in 2005 recommended that the Maryland EMS Plan be expanded and revised in light of national initiatives, such as the *EMS Agenda for the Future*.

Accordingly, MIEMSS began revising the EMS Plan in June 2005. A draft revised Statewide EMS Plan was completed in September 2005 and circulated throughout the State. MIEMSS solicited comments on the draft and held a series of meetings throughout the State to hear comments on the draft plan. Comments and suggestions were reviewed in detail and a revised version was completed based on the comments received.

The revised Statewide EMS Plan is organized according to the 14 EMS components identified in the *EMS Agenda for the Future* and incorporates a public health framework of system assessment, policy development, and system assurance. The Plan is also consistent with national initiatives, including the recommendations by the Institute of Medicine's Committee on the Future of Emergency Care in the United States Health System. The Statewide EMS Plan differs from previous plans in that, in addition to providing for the operation of the existing EMS system, the Plan identifies opportunities for improving the delivery of services and community health care through increased collaboration between EMS and public health.

By law, our statewide EMS system must be guided by a Statewide EMS Plan that identifies the goals and objectives for continued focus and further development. Our revised Statewide EMS Plan delineates the areas of work and focus for MIEMSS for the future and affects all aspects of the EMS system. The goals and objectives contained within the Plan will ensure the continued development and effective operation of our statewide EMS System.

On behalf of MIEMSS and the EMS Board, I thank the EMS providers and other interested parties who participated in this effort. The work, dedication, and commitment of the EMS community as a whole are what drive the success of emergency medical services in Maryland.

The MIEMSS 2005–2006 Annual Report provides a valuable overview of the state of EMS in Maryland and the accomplishments of MIEMSS and the Maryland EMS System over the past year. I also invite you to visit our web-page, [www.miemss.org](http://www.miemss.org) for more information. We thank the Governor, the General Assembly, the EMS community, and the citizens of Maryland for their continued support.

# MIEMSS

## ADMINISTRATION

*Mission: To secure and effectively utilize financial and personnel resources that will enable MIEMSS to meet its goals and objectives in a manner that is consistent with state regulations and policies.*

The Administration Office is responsible for the financial, purchasing, and human resources services of MIEMSS.

The finance staff is responsible for accounting processes to ensure that expenditures are in compliance with applicable regulations. The staff develops the budget, tracks and monitors expenditures, and performs year-end closing. The staff tracks special funds, grant funds, and reimbursable funds.

The purchasing staff procures all necessary supplies, materials, and services for the MIEMSS staff. It is also responsible for the timely payment of invoices.

The human resources staff is responsible for recruitment, timekeeping, payroll-related services, benefits and retirement coordination, personnel evaluation processes, and other traditional personnel functions.

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

MIEMSS FY 2006 budget information is displayed by state object code and department in the charts on page 5.



## AEROMEDICAL OPERATIONS

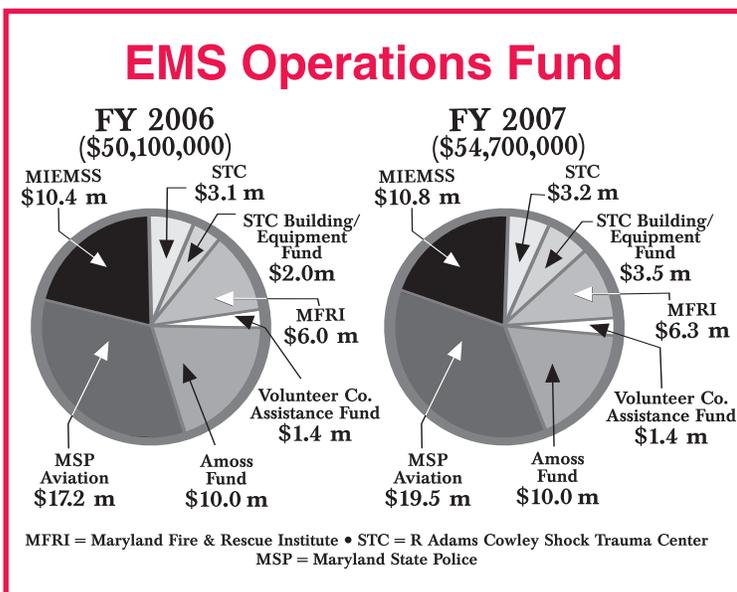
*Mission: To provide the physician medical support necessary for the Maryland State Police Aviation Command to meet the emergency helicopter needs of Maryland's citizens. The State Aeromedical Director is actively involved in the ongoing training and verification of skill proficiency for the State Police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

In FY 2006 there were 5,093 patients transported by the Maryland State Police (MSP) Aviation Command. Of these patients, 4,874 (96%) were transported from the scene of injury at the request of the local fire services, and 219 (4%) were transported between hospitals to a higher level of care.

Types of calls included the following:

• Motor vehicle crashes	2,383
• Falls	724
• Pedestrians	190
• Stabbings	103
• Gunshot wounds	101
• Assaults	88
• Burns	76
• Industrial accidents	45
• Hand injuries	43
• Hyperbaric patients	10
• Electrocutions	9
• Eye injuries	8
• Drownings	2

In March 2006, the Maryland State Police Aviation Command celebrated 36 years of providing med-evac service to the citizens of Maryland. In addition to being the oldest med-evac program in the country, Maryland is unique among the 50 states in ensuring that its med-evac, search and



rescue, and law enforcement services are available to all of its residents in a timely fashion, and are provided as a matter of public safety.

In FY 2006 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 again utilized for MSP flight paramedics in verification of advanced skill proficiency. These exercises, conducted at the University of Maryland Human Simulation Laboratories, 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 emergency medical services, 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 Attorney General's Office reviewed and prosecuted 30 cases of alleged prohibited acts by EMS providers and applicants.

The Attorney General's Office participated in a variety of committees, task forces, and work groups. The Attorney General's Office worked with MIEMSS to institute regulations for the designation of primary stroke centers and freestanding health facilities and to implement changes to the burn center regulations, the public access automated external defibrillator program, and the perinatal regulations.

The Attorney General's Office also oversaw the participation of MIEMSS in the Emergency Medical Services Do Not Resuscitate program.

## MIEMSS FY 2006 EMS OPERATIONS FUND APPROPRIATION BY DEPARTMENT

<b>Administrative Offices</b>	
Executive Director, Legal Office	\$570,325
Financial & Human Resources Administration	1,034,176
Planning/Program Development/Total Quality Management	312,845
<b>Communications</b>	
Equipment	1,258,817
Maintenance	1,475,647
EMRC/SYSCOM	973,573
<b>Education/Public Information</b>	
Education, Licensure, & Certification/Compliance	1,257,048
Public Information & Media Services	446,167
<b>Information Technology</b>	1,221,797
<b>Medical Services</b>	
Office of Medical Director	628,427
Office of Hospital Programs	112,697
EMS-Children	161,610
<b>Regional Administration</b>	848,029
<b>TOTAL</b>	<b>\$10,301,161</b>

## MIEMSS FY 2006 EXPENDITURE BY OBJECT CODE (INCLUDES SPECIAL AND FEDERAL FUNDS)

FY 2006	Actual
Number of Positions	92.6
Salaries and Wages	\$6,765,452
Technical/Special Fees	457,297
Communication	1,241,570
Travel	165,575
Fuel and Utilities	78,541
Motor Vehicle Operation and Maintenance	211,861
Contractual Services	1,131,067
Supplies and Materials	151,840
Equipment-Replacement	23,109
Equipment-Additional	143,920
Fixed Charges	76,316
Grants	2,082,304
<b>Total Expenditure</b>	<b>\$12,528,852</b>

The Attorney General's Office also participates in a work group of Assistant Attorneys General representing several state agencies studying the state's response to bioterrorism and other security issues. In addition, the Attorney General's Office participated in task forces monitoring the Automated External Defibrillator (AED) program, the Yellow Alert program, and developing EMAIS to replace the current paper runsheet with a computer software application.

The Attorney's General's Office assisted in the administration of several state and federal grant programs.

## COMMUNICATIONS ENGINEERING SERVICES (FIELD OPERATIONS)

*Mission: To provide the equipment, support, and expertise necessary to operate the statewide emergency medical services communications system.*

Highlighted for FY 2006 are three major items:

- The first Voice over IP telephone call in Maryland that fully used the Public Safety Intranet (PSI-Net) was made between MIEMSS and the Maryland Department of Health and Mental Hygiene (DHMH) on November 9, 2005.
- The digital microwave backbone was completed in Western Maryland on February 22, 2006 and now connects from Ocean City to Oakland.
- All of the necessary hardware needed to complete the western Emergency Medical Resource Center (EMRC) has been purchased and is in the process of being installed. Estimated completion is January 2007.

An active participant with other State agencies, MIEMSS Communications assisted with the design and installation of new towers and shelters at Lineboro (Carroll County), Marion (Somerset County), Smithville (Dorchester County), and Grantsville (Garrett County).

Progress continued with the build out of the Voice Over Internet Protocol (VOIP) network adding Carroll County Health Department, Frederick County Health Department, Cecil County Health Department, Springfield State Hospital, and MIEMSS EMRC 3, 4, and 5 to the already included DHMH. In addition, the Maryland State Highway Administration's CHART (Coordinated Highways Action Response Team) cameras in Western Maryland were added to the network.

Three regular Central Alarm Advisory Council meetings were held around the state—one in Anne Arundel County in August, one in Queen Anne's County in December, and one in Frederick County in April.

A total of 35 mobile EMS radios were distributed throughout the state. Grant funding in the amount of \$253,000 was supplied for the purchase of cardiac monitor/defibrillators and automated external defibrillators. Twenty-five new Med Channel base stations were purchased and installed around the state.

MIEMSS Communications processed a total of 1,238 service reports and performed 17 volunteer ambulance inspections during FY 2006.

## COMPLIANCE OFFICE

*Mission: To ensure the health, safety, and welfare of the public as it relates to the delivery of emergency medical services by Emergency Medical Services 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 Provider Review Panel (PRP) (the 13-member panel composed of all levels of EMS providers; physicians representing the Maryland Board of Physicians, the Maryland Medical Chirurgical Society, and the EMS Operational Program Medical Directors; the State EMS Medical Director; the MIEMSS Executive Director; the EMS Board; and the Attorney General's Office). 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.

## ACTIVITY REPORT OF THE INCIDENT REVIEW COMMITTEE (IRC), EMS PROVIDER REVIEW PANEL (PRP), AND THE EMS BOARD

• Incidents Reported to IRC	312
• IRC Investigations Initiated	235
• IRC Investigations Conducted	207
• IRC Investigations Continued FY 2007	28
• IRC Complaints Forwarded to PRP	30
• Complaints Dismissed by PRP	0
• Complaints Forwarded to EMS Board	30

### EMS Board Action

• Reprimands	8
• Probation	12
• Suspensions	5
• Revocations	6
• Remedial training	3
• Surrenders	1
• Evaluations	1
• Applications Denied	9
• Case Resolution Conferences	7
• Dismissed	0
• Counseling	1

## **DATA, INFORMATICS, AND RESEARCH OFFICE**

*Mission: To contribute to MIEMSS' mission of reducing preventable deaths, disability, and discomfort from injury and acute illness by supporting the ongoing effort of improvement of the EMS system through scientific analysis of EMS data, research, and development of EMS information collection and dissemination tools.*

### **Maryland Cardiac Arrest Public Defibrillation Study (M-CAPD)**

In 2001 the Maryland Cardiac Arrest Public Defibrillation Study (M-CAPD) was begun to address two main objectives: (1) to determine the impact of the Facility AED (Automated External Defibrillator) Program; and (2) to identify whether there is a need for the State to require that AEDs be placed in certain public locations. Associated data components of this study are being incorporated into the Maryland Cardiac Arrest Surveillance System (see below).

### **Maryland Cardiac Arrest Surveillance System (M-CASS)**

In order to address the public health burden of cardiac arrests and their associated EMS factors, MIEMSS established the Maryland Cardiac Arrest Surveillance System (M-CASS). The principal objectives of this surveillance system are: (1) to identify the epidemiology of out-of-hospital sudden cardiac arrest in Maryland; and (2) to evaluate the effectiveness of the Maryland EMS System in responding to cardiac arrests. The surveillance system captures all out-of-hospital sudden cardiac arrests that contact the 9-1-1 emergency medical system in Maryland. Standardized evaluation templates (Utstein) are just one of the techniques used to analyze the system information. Since its inception in January 2001, there are over 10,000 cardiac arrests documented in the system. Additional information about the epidemiology programs can be found on the MIEMSS website or by contacting the Office of Data, Informatics, and Research at MIEMSS.

### **DO NOT RESUSCITATE PROGRAM**

The current EMS/DNR form is maintained on the MIEMSS website where it may be downloaded by the public for use. MIEMSS will also provide copies to individuals without access to the internet.

In FY 2006, the EMS/DNR program provided 26 in-service trainings to health-care providers about the use of the forms and discussed the Do Not Resuscitate Program at two conferences.

## **EMERGENCY HEALTH SERVICES DEPARTMENT**

### **UNIVERSITY OF MARYLAND, 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 EHS Department recognizes as constituents the University of Maryland at Baltimore County, MIEMSS, and the Maryland, national, and international EMS communities.*

Demand has increased for EHS students upon graduation, with an increasing shortage of qualified paramedics nationwide and rapidly growing employment for management and graduate students in the realm of homeland security.

The department received a donation from the Shock Trauma Board of Visitors which allowed the department to purchase a full-size ambulance simulator for the clinical education classroom. The department continues to maintain Maryland accreditation from MIEMSS and national accreditation through CAAHEP. EHS majors are active members of 27 Maryland emergency services organizations.

The department's Critical Care Transport program continues to grow, now having served over 6000 students through 400 courses offered nationwide and beginning next year at international sites. The Pediatric and Neonatal Critical Care Transport program (PNCCT) has reached 500 students through 30 classes offered at nine sites nationwide.

The department's Center for Emergency Education and Disaster Research (CEEDR) continues to conduct externally funded research and training. Among the many projects of CEEDR has been work with the Maryland Department of Health and Mental Hygiene on EMS response plans for bioterrorism incidents and surge capacity planning with the Prince George's County Health Department.

The department's new graduate certificate in Emergency Management, offered entirely online, continues to expand in student enrollment.

## EMERGENCY MEDICAL SERVICES FOR CHILDREN

*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 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 in Maryland.*

The Emergency Medical Services for Children (EMSC) Program is responsible for the development of statewide guidelines and resources for pediatric care, the review of pediatric emergency care and facility regulations, coordination of pediatric education programs, and collaboration with other agencies and organizations focused on childhood health and illness and injury prevention. The EMSC Program coordinates the state Pediatric Emergency Medical Advisory Committee (PEMAC) and its subcommittees, the state Pediatric Quality Improvement Committee (QIC) and Pediatric Base Station programs, the five Regional Pediatric EMS Advisory Committees, state Risk Watch Team and federal EMSC grants.

### EMSC Program Activities

The state PEMAC Committee discussed the topics of membership and responsibilities during the past year, developing formal bylaws that were approved by the EMS Board and electing a Chair and Vice-Chair. PEMAC has three standing subcommittees: Pediatric Protocol Development, Education & PEPP Steering Committee, and Kids in Disasters. The EMSC Program staff and medical directors from PEMAC continue to support the Maryland Enhanced Prehospital Education for Prehospital Providers (PEPP) courses and coordinate the statewide PEPP Steering Committee to facilitate sharing of faculty resources, plan for recertification, and identify material that correlates with the Maryland EMS Medical Protocols. This steering committee meets jointly with the state PEMAC and the Maryland chapter of the American Academy of Pediatrics' (AAP) Committee on Pediatric Emergency Medicine. This committee met frequently during the fall of 2005 and spring of 2006 to implement the 2005 PEPP-2 edition and integrate the American Heart

Association 2005 changes for CPR and emergency cardiovascular care. PEPP-2 was rolled out at EMS Care 2006, with ongoing support for courses throughout 2006 from EMSC staff. Updates and information can be found at [www.miemss.org/EMSCwww/PEPPEnhanced2.htm](http://www.miemss.org/EMSCwww/PEPPEnhanced2.htm).

Prehospital continuing education programs involving topics on pediatric emergency or trauma care, as well as on prevention, were offered at several conferences throughout the state. The Peninsula Regional Medical Center Trauma Conference included displays on Family Preparedness for Disasters, and PEMAC Chair Elizabeth U. Berg presented "Tools for Transfer" from the Johns Hopkins PICU Transport team. Pyramid 2005 included a preconference on START/JumpSTART Pediatric Triage/Disaster Workshop and sessions on ATV injuries, Difficult Pediatric Medical Triage: Apparent Life-Threatening Event (ALTE), and a Pediatric Airway Rodeo Workshop. Winterfest 2006 featured another session on ALTE and Safe Transport of Children in Ambulances. The Miltenberger EMS & Trauma Conference 2006 included EMSC Project displays on Risk Watch Injury Prevention and Family Preparedness, along with a hands-on workshop focused on airway management for ALS and BLS providers. The EMS Care 2006 state conference included a preconference ALS/BLS PEPP-2 Course and Coordinator Orientation, as well as presentations on ALTE, ATV Injuries, Pediatric Pain Assessment and Management, and Safe Transport in Ambulances. Two hands-on workshops were supported by the Johns Hopkins Children Center—Pediatric Medication Administration and Advanced Pediatric Airway Management—in partnership with the EMSC Program and the Maryland State Police Aviation Division. The EMSC Partnership Grant projects and Child Passenger Safety Hospital project were presented at the state Emergency Nursing Association annual conference in May. In addition, Children's National Medical Center presented a session on recognition and management of the ALTE patient in the ED. In October, Children's National Medical Center coordinated the Advances in Pediatric Emergency Medicine Conference, hosted by Holy Cross Hospital and attended by EMS, nursing, and physician leadership from PEMAC and the regional pediatric committees.

Through the Maryland Medical Protocol review process, establishment of current state-of-the-art clinical approaches to managing childhood

emergencies continue to be developed and implemented. Protocol revisions were based upon a comprehensive evidence review and expert consensus process of the PEMAC. During each of the educational seminars and conferences in Maryland during 2005–2006, pediatric case reviews were presented to highlight the protocol changes for July 1, 2005 with a focus on ALTE and Pain. The EMSC staff partnered with the BLS Subcommittee and MIEMSS Office of Licensure and Certification to develop a PowerPoint training resource on proper spinal immobilization of infants and children. This resource will be made available to all county and college EMT training programs.

During May 2006, EMS for Children’s Day was celebrated across Maryland through the recognitions of children and youth who have

demonstrated one of the 10 Steps to Take in an Emergency or one of the 10 Ways to be Better Prepared for an Emergency. On May 17, 2005, Governor Robert L. Ehrlich, Jr. presented five young Marylanders with awards for their actions that ensured another person would receive "The Right Care When It Counts." Public service announcements and a Maryland EMSC Day poster are available in English and Spanish to continue the public education message promoting injury prevention, family preparedness, and appropriate emergency actions. More information can be found at

[www.miemss.org/EMSCwww/RightCare.html](http://www.miemss.org/EMSCwww/RightCare.html)

The Pediatric QIC has provided the structure to develop standards and training for the two Pediatric Base Stations at Johns Hopkins Pediatric Emergency Department and Children’s National

 <b>Maryland EMS for Children Program</b> <b>2005 Injury Prevention Special Projects</b> EMS-Based Injury Prevention Program for Children July 2005–December 2005			
Region	Applicant & Partner	Summary of Project	Target Area
I	Frostburg Area Ambulance	<b>Child Safety Seat Resource for Allegany County Area.</b> Continue to support the Child Passenger Safety resource within Frostburg with the purchase of child safety seats & materials for both public seat checks and the replacement of car seats used during the response to the I-68 crash.	Children 0-12 in Frostburg area and Allegany County with a new focus on replacement of car seats following vehicle crashes.
V	Emergency Education Council Region V	<b>Poison Prevention Train the Trainer Program.</b> In partnership with the Maryland and National Capital Poison Centers, a workshop will be offered to EMS and hospital educators.	Community leaders who teach and promote poison prevention.
V	Emergency Education Council Region V  Tulip Grove Elementary and Bowie VFD	<b>RISK WATCH: Before &amp; After with Disaster Pilot.</b> Year 2 of a demonstration project with Bowie, Maryland to introduce disaster modules of RISK WATCH® with the EMA office and start RISK WATCH® prevention in the before- and after-school programs.	School-age children in Bowie, Maryland
Statewide	Regional Programs and Media Support Services	<b>Maryland EMSC Bilingual Poison Posters and PSA.</b> MIEMSS and the Maryland Poison Center designed and produced a bilingual poster with the national 1-800 number for Poison Information. This project reproduced the double-sided poster and PSA for continued dissemination.	Parents and caretakers of children across Maryland. EMS, hospitals, and public health agencies.

Medical Center Emergency Medicine and Trauma Center. These two Pediatric Base Stations provide statewide coverage for online and off-line pediatric medical direction with a primary focus on prehospital communication and education and a dual commitment to consultation for the community hospital 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.

### **Injury Prevention and Life Safety**

The EMSC Program staff actively 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. This collaboration provides a consistent flow of information to the five regional pediatric committees and the state PEMAC on injury prevention resources and initiatives. EMSC continues to participate on the Child Fatality Review committee in collaboration with the Maternal Child Health Department and with the newly formed Partnership for a Safer Maryland led by the Department of Health and Mental Hygiene (DHMH) and funded by a Centers for Disease Control (CDC) grant.

For the past 6 years, the federal EMSC Partnership Grant has been able to fund Special Projects in Injury Prevention. The last year that EMSC grant funds were able to provide this funding to local and county programs was 2005. The recipients during the federal FY 2005 grant period are listed in the table in this report. A summary of all the projects funded during both grant periods is available from the EMSC office and will be posted on the EMSC website.

The Maryland RISK WATCH® Champion Management Team is led by the MIEMSS EMSC Program and the Office of the State Fire Marshal, in collaboration with the Maryland State Firemen's Association Fire Prevention Committee and the Maryland and local Safe Kids coalitions. Other partners in RISK WATCH® include the State Highway Administration, 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 third year of the RISK WATCH®

Champion program, eight communities have placed the RISK WATCH® program into classrooms, before-and after-school programs, summer camps, and injury prevention programs. These communities are Montgomery County Fire & Rescue, Prince George's County Volunteer Association, special needs schools in Prince George's County, Howard County Safe Kids and Park & Recreation after-school programs, parochial schools in Charles and St. Mary's counties, summer camp activities in Frederick County, and a public school in Carroll County. MIEMSS has developed a website page for RISK WATCH® and produced posters and mouse pads to increase the access for teachers and parents in other counties and school systems. Information can be found at

[www.miemss.org/EMSCwww/RISKWATCH2.htm](http://www.miemss.org/EMSCwww/RISKWATCH2.htm).

The Maryland State Firemen's Association provided the funding for schools to receive "RISKY BUSINESS" boxes that include training equipment and videos on life-safety skills. RISK WATCH® projects were displayed at the September 2005 MidAtlantic Life Safety Conference, the March 2006 Public Education and Life Safety Seminar, and the June 2006 Maryland State Firemen's Association Convention. Some of the schools and programs are exploring the Natural Disasters curricula and modules from both RISK WATCH® and the American Red Cross. Additional information and monthly updates can be found at

[www.miemss.org/EMSCwww/RISKWATCH2.htm](http://www.miemss.org/EMSCwww/RISKWATCH2.htm).

### **EMSC Grant Activities**

Federal EMSC grants are coordinated through the Maryland EMSC Program Office, involving statewide projects, specialized targeted issues, projects, and research initiatives at academic universities. The Maryland EMSC Program continued to support the EMSC Regional Symposia and provides ongoing leadership in the coordination of the Mid-Atlantic eight-state EMSC Region. The Mid-Atlantic EMSC group includes Virginia, West Virginia, the District of Columbia, Maryland, Delaware, Pennsylvania, New Jersey, and New York. The fourth Symposium was hosted by Pennsylvania in November 2005, with participation from four Maryland EMS Regions and presentations on Family Centered Care from PEMAC members, along with faculty from the Children's National Medical Center and the Johns Hopkins Children's Center.

The federal EMSC 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. In 2005, MIEMSS became the nation's first formally recognized EMS affiliate in the federally-funded PECARN. As part of the Chesapeake-Atlantic Research Node's (CARN) competitive renewal application to continue as one of four Regional Node Centers in the country, MIEMSS was proposed as a nodal affiliate to facilitate development of prehospital and EMS research capacity in the network. This is a high priority for the PECARN, and the EMSC Program at MIEMSS looks forward to reporting and disseminating progress reports emerging from this relationship in the coming years.

MIEMSS has again been awarded an EMSC State Partnership Grant from the Maternal Child Health Bureau/Health Resources Services Administration of the U.S. Department of Health and Human Services, in joint sponsorship with the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation. The 2006–2009 EMSC Partnership Grant will focus on the continued integration of EMSC into the statewide EMS System utilizing the federal EMSC Performance Measures as targeted projects. The specific grant goals include:

1. Monitor the impact of the EMSC initiatives within the state, based upon the 10 federal EMSC performance measures published in 2005.

2. Enhance the current EMSC data initiatives and activities in both the EMS and Hospital data sets to include provision of state, regional, and jurisdictional information on children and participate in the NEMSIS data work groups.

3. Expand the current EMSCS pediatric education activities available to both out-of-hospital and hospital providers through regional and state conferences, with a continued annual EMSC "Right Care When It Counts" recognition process.

The Kids in Disasters (KIDS) projects started in the previous EMSC Partnership Grants will continue to be supported through partnerships with regional educational councils and other agencies. These KIDS projects include the following initiatives:

1. Pediatric Triage Training with START and JumpSTART training with corresponding tabletop exercises and scenarios focused on children.

Specialized JumpSTART training backpacks have been developed for local drills.

2. Maryland Moulage Team continues to assist in the preparation of victims for full-scale drills. Moulage support is coordinated by the Emergency Education Council of Region III, and information is available on the Emergency Education Council of Region V website at

<http://www.eecreg5.org/moulage/index.htm>.

3. Family Preparedness information and interactive display has been developed that combines information for state and national organizations with a special emphasis on the role of children in family preparedness.

4. The Maryland Virtual Emergency Response Systems (MVERS) continues as a joint project with the Maryland State Police, the MIEMSS Field Operations Support Team, and school partners. The program focuses on improving and enhancing the communication and coordinated response of public safety, public health, and educational professionals to critical incidents, both man-made and natural.

### **Child Passenger Safety Project**

The EMSC Program continues to provide a fifth year of leadership and to receive a Maryland Department of Transportation Highway Safety Grant focused on improving the child passenger safety (CPS) resources within Maryland hospitals and health care professional practices. MIEMSS collaborated with the Maryland Highway Safety Office, the Kids in Safety Seats (KISS) program, and the Maryland chapter of AAP to host an annual February CPS conference call. The 2006 CPS conference call provided primary care and hospital professionals with information on "Prescription for Your Child Safety" materials that focus on the four steps in child restraint as children grow. The project also included the following ongoing projects:

1. Updating resources on the CPS website [www.miemss.org/EMSCwww/CPSHome.htm](http://www.miemss.org/EMSCwww/CPSHome.htm).

2. Maintaining a network of hospital contacts and CPS technicians;

3. Providing workshops focusing on CPS Best Practices held at several hospitals across the state;

4. Participating in the Child Passenger Safety Board's development of statewide guidelines and resources; and

5. CPS Hospital information displays and demonstrations of the project products at EMS, Nursing, and Pediatric conferences across the state.



### **EMRC/SYSCOM (FIELD OPERATIONS)**

In FY 2006, the Emergency Medical Resource Center (EMRC) handled 173,903 telephone calls and 133,329 radio calls. Of these 307,232 calls, 115,933 were communications involving a patient or incidents with multiple patients.

In FY 2006, the System Communications Center (SYSCOM) handled 59,623 telephone calls and 4,835 radio calls. Of these 64,458 calls, 6,789 were related to requests for med-evac helicopters.

EMRC/SYSCOM continued participation in the National Disaster Medical System (NDMS). Utilizing the Facility Resource Emergency Database (FRED), EMRC/SYSCOM obtained hospital bed status information for routine quarterly exercises and in response to specific requests related to the war in Iraq.

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 500 calls for the Maryland Department of Health and Mental Hygiene (DHMH) 24-hour Duty Officer.

### **GOVERNMENT AFFAIRS**

The MIEMSS Office of Government Affairs works with Maryland government's Legislative and Executive branches, EMS providers, physicians, nurses, hospitals, and other health care providers on legislation that affects various components of the statewide EMS System. During the 2006 Legislative Session, EMS-related legislative initiatives included the following bills that were passed by the General Assembly and signed into law by the Governor:

- As of July 1, 2006, each county Board of Education must develop and implement an Automated External Defibrillator (AED) Program in public high schools that meets the requirements of MIEMSS' Maryland Facility AED Program.

- Starting October 1, 2006, a \$7.50 surcharge will be levied on motor vehicle convictions for which points may be assessed. After a certain amount is collected to cover the costs of implementing the surcharge, funds will be divided between the Volunteer Company Assistance Fund and a new State Police Helicopter Replacement Fund. The State Police Helicopter Replacement Fund is to be used for the procurement of new helicopters, auxiliary helicopter equipment, ground support equipment, and other equipment related to helicopters. After a total of \$20 million has been credited to the Volunteer Company Assistance Fund, 100% of the monies will be credited to the State Police Helicopter Replacement Fund.
- Nursing homes, assisted-living facilities, hospitals, group homes, and state residential centers must develop emergency plans that identify procedures to be followed before, during, and after an emergency. Plans must be available to local emergency management organizations and must address evacuation, transportation or shelter-in-place; family notification, staff coverage and responsibilities; and continuity of operations, including procuring essential goods, equipment, and services and relocation to alternate facilities. State agencies that are responsible for licensing human service facilities must adopt regulations regarding development of emergency plans no later than November 30, 2007.
- Changes were made to the Maryland Trauma Physician Services Fund, which was originally created in 2003. The changes include: (1) increasing reimbursement to Level II and Level III trauma centers for maintaining certain on-call physicians; (2) including The Johns Hopkins Health System Burn Program and The Eye Trauma Center at the Hopkins' Wilmer Institute as centers that may seek reimbursement under the Fund; (3) permitting a one-time grant to the Curtis National Hand Center at Union Memorial; and (4) requiring development of a process for an award of grants to Level II and III trauma centers for equipment primarily used in the delivery of trauma center, the total of which cannot exceed \$3 million.

- The Maryland Health Care Commission, in conjunction with MIEMSS and the Health Services Cost Review Commission, is to study the financial and other aspects of inter-hospital patient transfer and scene transfer by air ambulance services operating in Maryland. Study results are to be reported to the legislature by December 2006.

## HEALTHCARE FACILITIES & SPECIAL PROGRAMS

### Office of Hospital Programs

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

### Primary Stroke Centers

The Primary Stroke Center Designation Project is a response to sobering State and national statistics. The project's goal is to coordinate the delivery of care for acute stroke, which is currently the third leading cause of death in Maryland behind heart disease and cancer and accounts for hundreds of millions of dollars in annual health care expenditures. It is part of a portfolio of approaches, referred to as Maryland's Stroke Action Plan, coordinated by the Maryland State Advisory Council on Heart Disease and Stroke.

The Office's responsibility is to carry out the designation of Primary Stroke Centers as specialty referral centers statewide. The EMS Board promulgated regulations establishing the standards for these centers during December 2005 and they went into effect in May 2006. The standards are based on the recommendations of the Brain Attack Coalition, whose peer-reviewed recommendations for acute stroke care were published in the *Journal of the American Medical Association*.

The regulations include structural and functional requirements for hospitals wishing to be designated as Primary Stroke Centers. Examples are evidence of organizational commitment, an acute stroke team operating under validated protocols, medical and surgical resources, and a commitment to systematic quality management at the hospital and statewide levels. Like the efforts of the estab-

lished Trauma Quality Improvement Committee, the results of the Primary Stroke Center network will feed back into the system and complement the findings of EMS operational program quality management to effect state-of-the-art interventions and treatment.

Once Primary Stroke Centers are verified and designated, EMS will be able to route patients within time constraints to Primary Stroke Centers and bypass non-designated hospitals. Designation visits are expected to be completed during FY 2007. In order to facilitate online delivery of EMS stroke care education to further this effort, the Office of Hospital Programs secured a \$15,000 grant from the American Stroke Association.

### Freestanding Emergency Facilities

The Office collaborated with Maryland's Department of Health and Mental Hygiene (DHMH) to further integrate freestanding emergency facilities into the EMS system. MIEMSS offered constructive input to DHMH's licensing regulations. The Protocol Review Committee drafted a protocol enumerating those patients appropriate for transport to these facilities, and the Hospital Programs Office and the MIEMSS Attorney General's Office drafted an EMS regulation that establishes standards for EMS designation of Freestanding Emergency Facilities. They are expected to take effect in FY 2007.

### EMS Base Stations

Office staff also collaborated with the Office of the Medical Director on EMS Base Station verification during FY 2006. Thirty-nine hospitals, including two pediatric base stations, were re-designated. Office staff took on the responsibility of coordinating this process.



### ***Geriatric Emergency Medical Services Advisory Committee (GEMSAC)***

As part of an ongoing effort to maintain high-quality emergency medical care, MIEMSS identified a need for geriatric-specific EMS educational programs, evaluation of geriatric emergency assessment guidelines and treatment protocols, and other relevant geriatric emergency management issues. In order to incorporate a geriatric-specific component into the Maryland EMS System, MIEMSS established the Geriatric Emergency Medical Services Advisory Committee (GEMSAC), consisting of members with clinical knowledge and expertise in geriatric patient care.

The committee's primary responsibilities include the evaluation of current geriatric assessment guidelines, recommendations for geriatric-specific protocol changes, advisement on EMS geriatric educational curricula in the future, and research into EMS clinical issues specific to EMS. The committee meets on a quarterly basis and includes representation from physicians and nurses specializing in geriatrics and emergency medicine, EMS providers with geriatric clinical expertise and knowledge, and the Maryland Department of Aging. Issues reviewed within this forum included research on under-triage in elderly trauma patients and the frequency of EMS transports from nursing homes.

### ***Trauma System***

MIEMSS collaborated with the Maryland Trauma Network to develop a new trauma alert policy "Capacity Alert" that only affects the R Adams Cowley Shock Trauma Center (RA STC). Due to an increasing number of trauma incidents, this policy became necessary to ensure that some beds at the RA STC are consistently available to receive critically injured patients from the community/scene and via inter-hospital transfer on a statewide basis.

MIEMSS continues to work with the Maryland Health Care Commission to provide trauma registry data to validate trauma patients that are eligible for physician reimbursement under the Trauma Physician Fund.

The EMS Board approved changes to the current Burn Center Regulation that would allow MIEMSS to designate a Pediatric Burn Center; those changes became effective as an emergency regulation on June 1, 2006.

### **Office of Special Programs**

*Mission: To develop and implement policies, regulations, and programs for the enhancement and improvement of the statewide emergency medical services system and the community.*

### ***Yellow Alerts/Emergency Department Overcrowding***

MIEMSS continues to monitor statewide alert activity via the County Hospital Alert Tracking System (CHATS). Online reports containing individual facility alert activity for all hospitals are now available on the MIEMSS webpage at [www.MIEMSS.org](http://www.MIEMSS.org). Additionally, MIEMSS monitors emergency medical services (EMS) return to service times recorded on the MAIS (Maryland Ambulance Information System) runsheets.

"Return to service" time is defined as the amount of time a provider is at an emergency department (ED) with a patient before returning to service. Overall yellow alert utilization and return to service times continue to remain a concern. Although yellow alert utilization decreased in 2004, EMS "return to service" times and yellow alert utilization have again increased. The 2005-2006 flu season was relatively mild, according to reports from the Maryland Department of Health and Mental Hygiene; however, there were still significant increases in alert utilization, especially in Baltimore City. As a result, the City Health Commissioner and City Fire Chief convened a Task Force to address ED Overcrowding in Baltimore City. MIEMSS participated in the Task Force meetings and a subsequent report was distributed entitled "Baltimore City Task Force on Emergency Department Crowding: Findings and Recommendations." MIEMSS is currently working with members of the hospitals and EMS communities to implement two of the recommendations in the Task Force report.

National studies continue to indicate that inpatient capacity and prolonged throughput times are the largest reason for ED delays. MIEMSS and the Maryland Hospital Association are partnering to host a statewide ED Overcrowding Summit in the early Fall. National and local speakers have been invited to discuss strategies available for improving inpatient capacity and prolonged throughput times, thus decreasing ED delays. Hospital executives, physicians, and nurses, as well as the EMS community and various agencies and organizations such as the Maryland Health Care

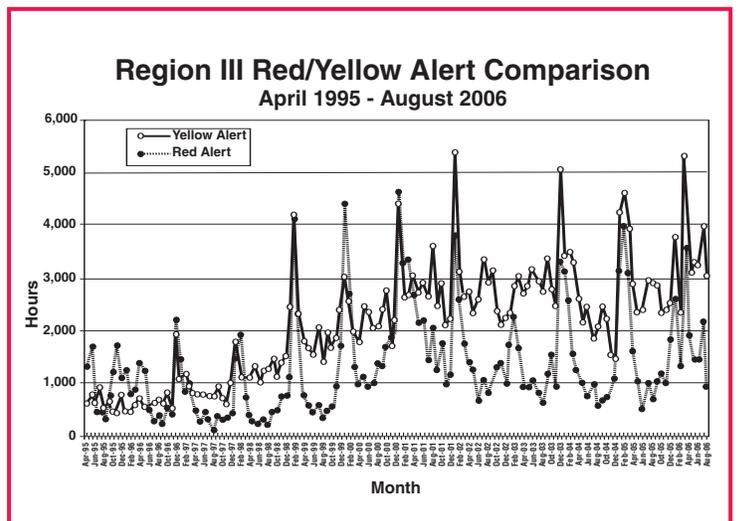
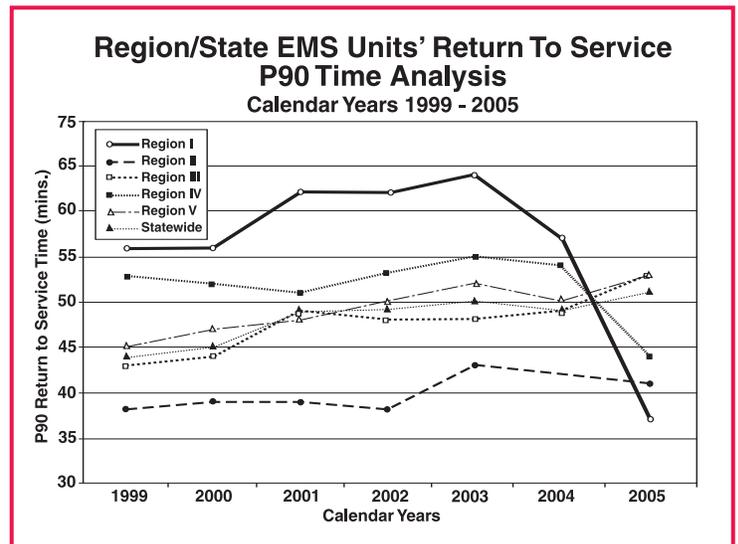
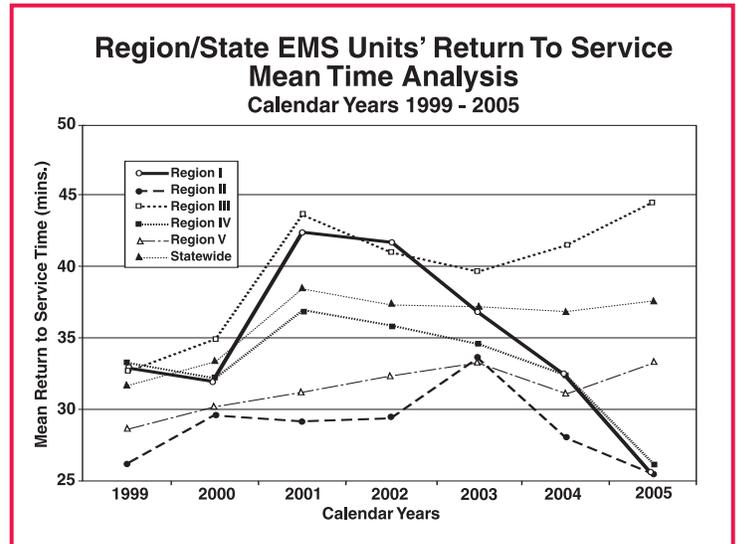
Commission, the Maryland Department of Health and Mental Hygiene (DHMH) Office of Health Care Quality, the American College of Emergency Physicians, and the Maryland State Firemen's Association, are being encouraged to attend.

### **Layperson Automated External Defibrillator Program**

The Layperson Automated External Defibrillator (AED) Program continues to flourish throughout Maryland. Under the "public access defibrillation" program, non-healthcare facilities that meet certain requirements are permitted to have an AED on site to be used by trained laypersons in the event of a sudden cardiac arrest until EMS arrives. The 2006 legislative session of the Maryland General Assembly passed a new law requiring all Maryland high schools to have AEDs. This is the first statewide mandate for AEDs in Maryland. Currently, there are more than 696 approved programs in the state, totaling 1636 sites with AEDs. The Maryland Facility AED Program has had 29 successful AED uses out of 161 reported incidents (18%). Success is measured by the patient having a return of pulse at EMS arrival or during EMS transport. Of the overall arrests, 87 were witnessed and 26 of those witnessed arrests regained a pulse at the time of EMS arrival for a 30% save rate for witnessed cardiac arrests. A list of AED facilities and program information can be viewed at [www.miemss.org/AED.htm](http://www.miemss.org/AED.htm).

The AED Task Force also continues to evaluate the AED program for barriers and obstacles to participation and make recommendations to ease and encourage participation, especially in high incidence locations of cardiac arrest.

MIEMSS, in partnership with EMS services in 14 rural jurisdictions in Maryland, including Garrett, Washington, Frederick, Carroll, Harford, Caroline, Dorchester, Kent, Somerset, Talbot, Wicomico, Worcester, Calvert, and St. Mary's counties, again obtained funds through the federal Office of Rural Health Policy's FY 2005 Rural Access to Emergency Devices Grant Program. This allowed for the placement of 73 AEDs and numerous CPR and AED training sessions in EMS, public safety, and layperson sites, resulting in nearly 500 individuals being trained in CPR and AED use. A total of 366 AEDs have been placed in eligible rural jurisdictions since the first grant funds were awarded in 2002. The third and final year of the project period was 2005. MIEMSS has advocated nationally for the continuation of the RAED grant in the future.





MIEMSS will again partner with several agencies and the State Advisory Council on Heart Disease and Stroke in a public awareness campaign designed to educate citizens on the Chain of Survival. The campaign encourages learning CPR, how to use an AED, and developing public access defibrillation programs when appropriate. Last year's awareness effort was kicked off at the 2005 Baltimore Heart Walk at Rash Field in Baltimore's Inner Harbor with a proclamation from Governor Robert Ehrlich, Jr. that declared November 2005 "Partner with Us: Create a Heart Safe Community Month." The proclamation was read to more than 2000 Heart Walk participants. The council again plans to request that November 2006 be proclaimed "Partner with Us: Create a Heart Safe Community Month."

In December 2005, the American Heart Association issued "The New Guidelines for CPR and Emergency Cardiovascular Care" which revised the algorithm for CPR and AED use for both laypersons and healthcare providers. MIEMSS issued recommendations to layperson facilities which can be viewed at [www.miemss.org](http://www.miemss.org).

## **INFORMATION TECHNOLOGY**

*Mission: To provide leadership, expertise, and coordination in information systems, data management, networking, and application development relating to emergency medical services systems.*

During FY 2006, the Office of Information Technology focused on the development and enhancement of their web-based systems. Approximately 1,000 additional volunteer and career EMS providers were trained on the Electronic Maryland Ambulance Information System (EMAIS), resulting in the elimination of paper-based patient care reports in five additional jurisdictions. Since EMAIS went live in 5 jurisdictions on July 1, 2004, it has been implemented in

22 jurisdictions (Allegany, Annapolis City, Aberdeen Proving Ground, BWI Airport, Calvert, Caroline, Carroll, Cecil, Charles, Dorchester, Frederick, Garrett, Harford, Kent, Martin State Airport, Maryland State Police Aviation Division, Queen Anne's, St. Mary's, Somerset, Talbot, Washington, and Wicomico). Prior to the development and implementation of EMAIS, commercial, paid, and volunteer EMS providers filled out more than 750,000 paper forms each year. EMAIS is saving money, improving the quality of prehospital care data, and significantly reducing the amount of time between the occurrence of an EMS call and receipt of documentation of the call.

The Information Technology Department continued scanning during FY 2006 for those jurisdictions that have not converted to electronic patient care reporting. By scanning and capturing images of prehospital care forms, it is possible to link the electronic images of records to the MAIS database. Linking images to database records will make available for review the text portions of the forms that are not otherwise captured electronically. As of June 2006, MIEMSS has successfully imaged over 3,000,000 MAIS forms.

A program to download EMAIS data to the paper-based MAIS database was developed to allow statewide data reporting of some data elements. Users of the web-based EMAIS system have the ability to access standard reports based on their activity. The EMAIS reporting system gives users the flexibility to access standard reports for multiple time periods, as well as various reporting levels, including jurisdictional, company, unit, and provider levels.

With MIEMSS expanding its web-based applications, the existing Universal Login System (ULS) also required enhancements. The new system, ULS2, is designed to allow users to log into a single portal to access all available applications and online services offered by MIEMSS. Plans are underway to use ULS2 as a portal to an online EMS continuing education system. This new feature would allow a provider to log on to the MIEMSS website, select a continuing education program, complete the online program, and receive state-approved continuing education credits.

MIEMSS expanded the existing web-based Continuing Education (ConEd) reports. Information available to EMS providers and jurisdictions via the web now includes provider certification status, tracking of continuing education credits, and jurisdictional provider reports, as well

as an EMS instructor corner promoting the sharing of EMS education information. Prior to this, jurisdictions had to request all reports from MIEMSS, with the reports being run by staff. Now authorized jurisdictional representatives, with proper rights through ULS, can run the reports themselves online. This is a huge time savings for the MIEMSS staff and allows faster turnaround of reports back to the jurisdictions.

The County Hospital Alert Tracking System (CHATS) surveillance program continually helps identify emergency department overcrowding as it occurs so that ambulances may be redirected to less crowded facilities, as needed. Neighboring hospitals and the public are able to view the status of specific hospitals at all times via the MIEMSS external web page. Report writing capabilities were enhanced this year to provide all hospitals with internet report access and timely self-production. In prior years, hospital administrators would have to wait until they received monthly reports to verify alert activity and assess demand trends. Further online reporting capabilities were made to evaluate the incidences of simultaneous hospital-specific Yellow and Re-Route alerts across the state.

MIEMSS continues to use its web-based system called FRED (Facility Resource Emergency Database). This was developed in response to the 9/11 tragedy. During any disaster or emergency, MIEMSS would contact hospitals for a status of available beds. The time for the hospitals to respond would vary, depending on numerous factors, but it could take many hours for all hospitals to respond. FRED allows MIEMSS to send an alert to all hospitals requesting an update on their current status. This includes not only beds, but also staffing and medications, as well as information from the local jurisdictions regarding EMS staffing. FRED will reduce the time it takes to collect this data and make the process more efficient. FRED version 2.0 was implemented in April 2004. Version 2.0 has many additional features that give tighter control over who gets alerts, how the alerts are sent, and what data points are collected.

## 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 pre-hospital professionals who deliver emergency care in the Maryland EMS system.*

During FY 2006, the total number of career, volunteer, and commercial ALS providers (CRT, CRT99, and EMT-P) increased in FY 2006, while the overall number of prehospital providers in Maryland decreased slightly from FY 2005. See the chart below for a breakdown of providers.

Throughout FY 2006, the Office had an increased workload and issued 3,708 initial licenses and certificates, as well as renewed 7,324 pre-hospital provider licenses and certificates. The number of initial certifications and licenses exceeds the previous fiscal year and is the highest in nearly a decade. The largest growth, by percentage, was with CRT99 and paramedic. (See *Initial Certifications and Licenses Issued* chart, page 18.) The Office worked with other departments throughout the agency by providing provider data and trends to the Workforce Committee, which was developed to analyze trends pertaining to the recruitment and retention of prehospital professionals.

In support of the BLS Committee of the Statewide EMS Advisory Council (SEMSAC), the Office worked to implement the 2005 American Heart Association's Guidelines into EMS educational programs and State examinations. The BLS Committee worked on the EMT-Basic and First Responder practical examinations to make them align with the new guidelines. In addition to the content of the exam, the Committee also looked at the format of the practical examination sheets. After a thorough analysis and review of the existing forms, the committee worked diligently with its constituents to develop a more user-friendly and more encompassing practical examination. The make-up of the exam and its scenarios were determined by reviewing ambulance runsheet data, as well as incorporating instructor review and feedback to have the scenarios reflective of current field practices, specifically criticality and frequency

	FY04	FY05	FY06
First Responders	10,551	10,980	10,666
Emergency Medical Technicians - Basic	15,323	15,609	15,285
Cardiac Rescue Technicians	361	312	277
Cardiac Rescue Technicians - Intermediate	252	342	505
Emergency Medical Technicians - Paramedic	2,192	2,180	2,200
Emergency Medical Dispatchers	873	731	732
<b>TOTAL</b>	<b>29,552</b>	<b>30,154</b>	<b>29,065</b>

of skills. The new proposed exam has a medical station, a resuscitation station, and a trauma station. Pilot and beta testing of the practical examination scenarios and forms took place throughout May and June, and will continue into July. Instructors and evaluators will be updated to the content of the exam in the months of July and August 2006 and the exam is to be implemented for all EMT-B courses that begin after August 1, 2006.

In response to requests from training centers and instructors alike, the BLS Committee also has developed a Skills Update course for EMS Instructors. The goal of this program is to ensure accuracy and promote consistency in skills instruction. The program will focus on one set or a series of skills annually. The focus for this first year is spinal immobilization. A photo shoot was conducted in January, from which a series of spinal immobilization skills photo sheets will be used as references for instructors. The skills will be printed onto skills sheets, and will also be available to instructors via the web. In the months of October and November 2006, the spinal immobilization skills sheets will be unveiled to instructors across the State. The update sessions will occur in the various regions of the State.

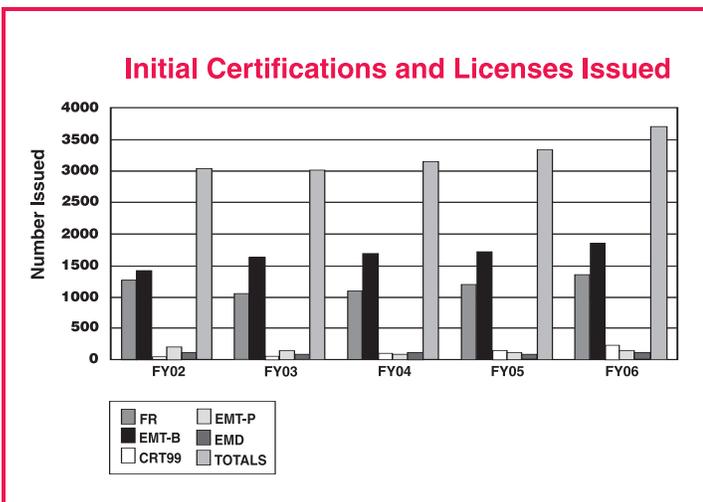
The Office of Licensure and Certification has been working closely with participating states in the Atlantic EMS Council (AEMSC) to expand the options and features of the test-generating and grading system used by all members. In August 2005, the Council received a positive review of the test-generating and grading system used by participating members. The review was conducted by a psychometrician who provided an in-depth analysis of the test development processes and database.

The program, TG2000, is a database system that allows for the creation of valid and reliable, high-stakes certification and licensing examinations. In addition to verifying the validity of the processes and program, the consultant psychometrician reviewed test-bank items. One recommendation made by the consultant involves transferring the TG2000 to a web-based, secure system. Subsequent to the review and analysis, the Office, in conjunction with the Council, has initiated the planning process for the new test-generating and grading program, slated to be available by late FY 2008. The Council has also continued to develop, pilot, and add examination items to the bank, including several hundred test items from North Carolina, the newest state participating with the AEMSC.

The National Registry of Emergency Medical Technicians (NREMT) is scheduled to fully implement their computer-based testing (CBT) on January 1, 2007. To prepare for this implementation, which will impact all of Maryland's EMT-I99 and EMT-P candidates who take the NREMT examination on January 1, 2007 and beyond, this Office has presented information to the various constituents. Furthermore, representatives from the NREMT have come to Maryland on several occasions to review the process, answer questions, and help to prepare the Maryland EMS educational system for the transition to the CBT. The transition to the CBT will allow for quicker turn-around times of written examination results, as well as increased security and precision of measurement of candidates.

In an effort to provide more automated services to Maryland's EMS providers, the Office has worked diligently with the Information Technology (IT) Office to create more online EMS provider services. During FY 2006, the Office of Licensure and Certification and the IT Office implemented web-based programs that allow jurisdictions and providers to access more provider information, jurisdictional provider reports, continuing education reports, and an instructors' corner for the sharing of EMS educational information throughout the State. Furthermore, a beta test for online EMT-Paramedic re-licensure was successfully conducted this year and is to be fully implemented for the April 2007 renewal season. By 2009, the Office anticipates to have over 75% of certification and licensure services available to EMS providers via the web.

The Office has also continued with initiatives to continually increase the quality of educational



services provided to EMS providers, as well as to offset costs. In January, the second annual EMS Educators' Symposium took place at College Park. MIEMSS and the Maryland Fire & Rescue Institute (MFRI) brought in Mike Smith, a nationally recognized EMS speaker, from Washington State to offer talks on evaluating students and programs. The symposium also allowed for sharing of information between the programs with the ultimate goal of continually improving the quality offered to Maryland's EMS students. Additionally, the Office continues with the education program approval process with the second round of site visits slated to begin next fiscal year. The approval process and its associated annual reports help to ensure that educational programs have adequate physical, financial, and human resources to ensure course completion and adequate student outcome. Furthermore, the Office continues to coordinate grants offered to EMS educational programs and jurisdictions which supplement courses and training offered to EMS providers and candidates. This year, over \$310,000 were offered to ALS educational and jurisdictional programs and over \$50,000 were offered to Emergency Medical Dispatcher programs to help offset the costs of delivering quality educational programs.

### **MARYLAND CRITICAL INCIDENT STRESS MANAGEMENT PROGRAM**

*Mission: To offer psychological support services to firefighters, emergency medical technicians, police, and other emergency services personnel involved in emergency operations under extreme stress, to minimize the impact of job-related stress, and to help accelerate recovery of those persons exhibiting symptoms of severe stress reaction.*

The Maryland Critical Incident Stress Management (MCISM) program offers education, defusings, and debriefings conducted by a statewide 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 persons trained in the process. Volunteer regional coordinators are responsible for specific geographic areas of the state and serve as the points of contact, through local 9-1-1 centers and SYSCOM, for critical incident stress management.

### **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 Office of the Medical Director was invited to Allegany, Garrett, and Kent counties to conduct a SWOT (Strengths, Weaknesses, Opportunities, and Threats) process to address selective EMS issues to improve the delivery of prehospital medical care. SWOT Task Forces were formed and they completed comprehensive reports for their respective County Executives. The formal Town Hall presentations and delivery of reports to the County Executives were conducted by State EMS Medical Director Dr. Richard Alcorta (facilitator), with the members of the individual SWOT Task Forces. These presentations were well received by the community and the press. Even before the final reports were presented, recommendations from the SWOT Task Force reports were being implemented to improve Advanced Life Support coverage and availability.

The Office of the Medical Director, the University of Maryland at Baltimore, and the National Study Center for Trauma and Emergency Medical Systems delivered an International Emergency Preparedness and Response Program for physicians from Iraq and Egypt. This program was delivered in Aman, Jordan and in Cairo, Egypt to physicians and public health directors. The program focused on educating an elite cadre of health professionals who could review and improve existing plans, as well as deliver quality medical/trauma care in the event of a disaster (natural or man-made). The educational program culminated in a comprehensive tabletop exercise that generated recommendations and action items.

MIEMSS mobilized significant resources for the response to Hurricane Katrina last year. The Office of the Medical Director worked closely with the Division of Field Operations to deploy EMS personnel, ambulances, and medical supplies which responded to New Orleans (Jefferson County) as part of an Emergency Management Assistance Compact request. In less than 72 hours, MIEMSS had coordinated and credentialed a Task Force of dedicated EMS providers who were rotated in and out of the region over the course of the deployment.

One of the lead responsibilities for the Office of the Medical Director is to ensure quality online medical direction and a quality review process for Base Station hospitals giving "real time" medical consultations with EMS providers. The Base Station Regulations went into effect in 2000, and the 39 existing Base Station hospitals were evaluated for compliance to those regulations through site visits with a team composed of a member of the MIEMSS Regional Offices, a Registered Nurse Program Director, and the State EMS Medical Director. Each of the 39 hospitals conducted a self-assessment survey followed by the site visit. The findings of the site-visit teams were presented to the EMS Board, and all 39 hospitals were re-designated as Base Stations. Two additional hospitals applied for and received designation as new Base Station Hospitals—McCready Hospital in Somerset County and Good Samaritan Hospital in Baltimore City.

The Eleventh Annual Medical Directors Symposium was conducted, with participation by regional, jurisdictional, and commercial ambulance service medical directors, as well as base station physician coordinators. The Symposium was well attended and the presentations included:

- State of the State and Work Force Report
- Nursing Home Assessment and Triage Guidance Tool (draft for comment)
- EMS for Children Program Update
- Katrina: Maryland's Mission, Response, Deployment, and the Emergency Management Assistance Compact (EMAC) Process
- EMAIS: Electronic Patient Care Report
- Multiple Single Casualty Incidents: Anatomy of a Day of Terror; Implications for an EMS Jurisdiction
- Surgical Cricothyroidotomy
- Health Care Decisions: Differences Between Patient Care Plan, Advanced Directives, and EMS/DNR

MIEMSS supported and sponsored several major EMS provider educational opportunities. The Office of the Medical Director was a lead presenter in several of these forums, as well as in physician and nursing educational programs. The topics presented were as follows:

- Bioterrorism vs. Mother Nature's Revenge
- Visual Clues for Traumatic Patient Assessment
- Principles of Radiation: A Better Understanding of Radiation May Just Save Your Life

- Health Care Decisions in Maryland: Applying Maryland's "Do Not Resuscitate" Law (Sarah Sette, Esq., author)
- Maryland Stroke Care System: An Overview (Team presentation with John Young, RN)
- National Incident Management System for Maryland Board of Physicians for Their Volunteer Physicians Corps
- Bioterrorism Agents: Recognition and Management for the Maryland Board of Nursing for Their Volunteer Nursing Corps

One of the great challenges for healthcare professionals is the establishment of minimal educational requirements. The American Medical Association, in cooperation with the American College of Emergency Physicians and the National Disaster Life Support Foundation (NDLSF), have developed, tested, and standardized a package of courses that provide a tiered series of courses that build on the previous program. The three main courses are Core Disaster Life Support (4 hours), Basic Disaster Life Support (BDLS) (8 hours), and Advanced Disaster Life Support (ADLS) (13 hours didactic and actual hands-on triage, incident management implementation, and patient care). MIEMSS approached the lead academic institutions within Maryland to establish a statewide NDLS steering committee. This coalition is composed of the Maryland Fire & Rescue Institute (MFRI), the University of Maryland Baltimore County's Center for Emergency Education and Disaster Response (CEEDR), the R Adams Cowley Shock Trauma Center/University of Maryland Medical System, MIEMSS, and the Johns Hopkins' Office of Critical Event Preparedness and Response (CEPAR). Maryland developed a cadre of ADLS instructors. The NDLSF then came in and conducted a site survey of Maryland's NDLS Educational Program and approved and credentialed the Regional Maryland NDLS Coalition as a NDLS Regional Training Center. Multiple organizations and hospitals are interested in this type of training to support minimal credentialing of their staff as part of their disaster preparedness.

In an effort to reduce death and disability from drug and alcohol-related vehicle crashes, Dr. Richard Alcorta, State EMS Medical Director, participated in a WBAL-television program that highlighted strategies to discourage drug or alcohol use and driving. This was a cooperative program of multiple state agencies (MIEMSS, the Maryland State Police, and the Maryland Department of

Transportation), the University of Maryland Medical System, and several private sector organizations.

Due to the American Heart Association's change in management of cardiac arrest patients in December 2005, MIEMSS moved the implementation of the new *Maryland Medical Protocols for EMS Providers* to January 2007, which allowed for clarification and modification of these changes to be incorporated into the statewide protocols. The following protocols have either been added or undergone major revisions:

- All cardiac protocols that include the delivery of CPR or use of an Automated Electronic Defibrillator (AED)
- ST Elevation Myocardial Infarction [STEMI] Protocol (including 12-lead ECG which is required by July 1, 2008)
- Burn Protocol/Carbon Monoxide or Toxic Fume Inhalation
- Accessing Central Venous Catheters and Devices Protocol
- Pulmonary Edema/Congestive Heart Failure Protocol (including CPAP which is required by July 1, 2008)
- Captopril (Capoten), Etomidate, Nitroglycerin Paste
- Specialty Care Transport (Optional Supplemental)
- Trauma Arrest Protocol (Bilateral Needle Chest Decompression)
- Chronic Ventilated Patients Protocol (Optional Supplemental)
- Transport to a Freestanding Medical Facility Protocol (Optional Supplemental)
- Tactical Emergency Services Protocol (Optional Supplemental)

The threat of the current Avian Flu (H1N5) bridging the species gap and becoming a human-to-human transferable disease raised the concern that the health care system should be prepared for a potential Pandemic Influenza outbreak. As part of the President's, Surgeon General's, and the CDC's federal preparedness program, multiple State-based presentations were made to highlight the Pandemic Influenza planning, preparedness, and interface with the private sector (hospitals and clinicians). MIEMSS supported the Maryland Department of Health and Mental Hygiene in making this a successful conference. Dr. Richard Alcorta was a speaker presenting "Emergency Medical Services and Hospital Systems: Pandemic Flu Facing the Facts."

## PUBLIC INFORMATION AND MEDIA 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.*

The Office of Public Information and Media Services provides education and information to Maryland's Emergency Medical Services providers and the general public through training modules and informative programs. The office develops, designs, and produces programs that are distributed statewide.

The office is responsible for the design, photography, and editorial content of the MIEMSS Annual Report, MIEMSS web page, and the "Maryland EMS News." During FY 2006, the newsletter became all "electronic." It is now emailed to hospital and prehospital EMS personnel. Registration is obtainable on the MIEMSS web page. The newsletter keeps emergency medical services 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 medical issues. These documents can also be found on the MIEMSS web page. A full update of the *Maryland Medical Protocols for EMS Providers* was completed, including editing, layout, and design.

This year the annual EMS Week Stars of Life Awards Ceremony was held in Annapolis at the State House with the assistance of Governor Robert L. Ehrlich, Jr., and First Lady Kendel Ehrlich. They assisted with both the EMS for



Children "Right Care When it Counts" Awards and the Stars of Life Awards. Governor's proclamations in recognition of the National EMS for Children Day and EMS Week were presented. Press releases were distributed statewide and media coverage obtained on the award winners. Press releases were also produced during the year on many EMS-related issues, including Yellow Alerts and hospital emergency department overcrowding. A major event, the Maryland Pandemic Influenza Summit, in conjunction with Mike Leavitt, Secretary of Health and Human Services, took place on February 24, 2006. Participation in the Washington Metropolitan Media Relations Council and the Baltimore Area Public Safety Media Council continues to promote good working relationships between the press and public safety public information officers.

The Office provides conference planning, as well as technical and audiovisual support to MIEMSS-sponsored continuing education programs. These regional and statewide conferences allow providers to update their certification and licensure by attending courses. Design and production of printed materials, photographic, computer-assisted programs, and video productions assist with the learning process.

The MIEMSS exhibit is utilized to spread information about the EMS System and prevention topics. It was in use at the Maryland State Firemen's Association (MSFA) Convention, many EMS conferences, open houses, and the annual Maryland Association of Counties convention.

Several training modules were produced during the past year. These included "The Prehospital Protocol Update," "Bystander Care," "Base Station Communications for Emergency Department Personnel," "Realism through Moulage," and "Maryland Triage Program." These modules were produced on compact disc and include printed materials. The office provided satellite down-linking and taping of many informational programs, including topics such as infection control and WMD/Bioterrorism issues.

Video projects included the documentation of various Haz-Mat and multi-casualty disaster drills throughout the State. Other projects included "Bystander Care Training" and "Inspector Detector," in conjunction with the Baltimore Safe Kids and the Baltimore City Fire Department. Working with the MSFA, the Office staff produced the annual convention's Memorial Service program, video eulogies, and slide show.

Statewide prevention initiatives were developed through partnerships with other state and local government agencies. Participation with the Occupant Protection Task Force, the Motorcycle Safety Task Force, the Pedestrian Safety Task Force, the Impaired Drivers Coalition, the American Red Cross Hometown Heroes Program, the Maryland Partnership for a Safer Maryland, Maryland Committee on Trauma, and the R Adams Cowley Shock Trauma Center Prevention Committee allowed these teams to work collaboratively on multiple projects. Membership on the State Highway's Diversity in Traffic Safety Program raised the awareness for diversity in public education efforts. Print and broadcast projects were produced in both Spanish and English. Projects were completed with representation of Maryland's growing diverse population.

## **QUALITY MANAGEMENT**

*Mission: To support 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 those individuals practicing quality management principles within the state EMS community in its efforts to improve upon its services and customer relationships.

## **Managing for Results (MFR)**

For the past ten years, MIEMSS, like all State agencies, has been required to submit a Managing for Results (MFR) plan along with its fiscal year budget requests to the Maryland Department of Budget and Management. Initiated in 1997, this phased-in planning process began with the submission of MIEMSS Vision, Mission, and Principles statement through a customer-focus strategic planning process. MIEMSS has again met those requirements; these include re-evaluation of key goals, establishment of subsequent objectives and strategies, development of associate action plans, and creation and monitoring of performance indicators.

MIEMSS has identified two strategic goals and seven associated objectives. Three objectives are outcome oriented, while the remaining four are quality-based indicators. Each objective included performance indicators, which will help both system and jurisdictional quality management initiatives in establishing benchmarks for future quality control and quality improvement efforts.

## 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** Maintain an overall inpatient complication rate of 10% or less for Maryland trauma centers.

**Objective 1.3** Achieve 20% witnessed sudden cardiac arrest resuscitation upon emergency department (ED) arrival in 70% of jurisdictions by 2003.

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

**Objective 2.1** Ensure all jurisdictions use a uniform set of quality indicators for prioritized emergency medical dispatch (EMD) services.

**Objective 2.2** See that jurisdictions achieve or exceed 90% compliance with prehospital provider standards of care per the "Maryland Medical Protocols" annually.

**Objective 2.3** Maintain an EMS response incident location to hospital base station communication at a successful completion rate of 95% or better.

**Objective 2.4** Maintain at least an 85% rate for seriously injured patients transported to a designated trauma center in Maryland.

## Team EMS

An innovative approach to Quality Management education and application in the real world of EMS management was developed in conjunction with the MIEMSS Region V administration.

Implemented in 1996 and updated to present standards, MIEMSS staff and a cadre of volunteer presenters from the EMS community present ways for company and jurisdictional managers to plan for, measure, maintain, and improve quality services. Techniques taught range from brainstorming to data analysis interpretation and include topics from quality improvement team creation to meeting quality assurance standards established under state law. Jurisdictions and Regional EMS Advisory Councils have utilized this training for planning purposes, and more than 100 providers have attended workshops at Pyramid and EMS Care on a variety of subjects from indicator development to data interpretation.

Beginning in Calendar Year 2002, and in accordance with Title 30 regulations, all Maryland jurisdictional programs have implemented their own quality assurance/quality improvement plans. In this evolutionary process, Team EMS has provided the skills set for effective and continued success in meeting the goals of these plans. Particular interest has focused on the role of local QA/QM managers and the skills to be an effective quality leader. A two-day core curriculum was developed and presented at EMS Care '06 to over 35 QA/QM representatives from across the state. Through the work of MIEMSS and the Regional Jurisdiction Quality Improvement Committee, proposed regulations were developed for Title 30 regulation inclusion consideration.

## EMS Surveillance Measures

MIEMSS has established several EMS system surveillance priorities based upon routine data review, customer requests, and research outcomes. Hospital yellow alert demand is monitored daily on a regional basis to keep individual hospitals updated on system response capabilities. This monitoring (especially in the winter months) and individual hospital resolution to high emergency department (ED) service demand helped keep this vital service available system-wide. Joint work under several MIEMSS-sponsored committees has continued to address both immediate resolution and long-term strategies in the mitigation of ED overcrowding and the effects on EMS services. Additionally, detailed analyses of the triage of geriatric trauma patients have continued, and findings have been presented to the EMS community for the development of improvement strategies.

## Special Needs

Both the National Highway Traffic Safety Administration (NHTSA), through Maryland's Crash Outcomes Data Evaluation System (CODES) funding, and the Maryland Highway Safety Office grants resources have continued to support efforts in EMS data linkage to multiple crash-related data sets. This year's funding request for EMAIS upgrades and mobile solution approaches received high priority. In accordance with both the State EMS Plan's and the State Highway Safety Plan's prioritized objectives, EMS data are essential in the improvement of prevention and ultimate patient outcomes of victims of motor vehicle crashes. Incorporation of prehospital data requirements from the National EMS Information System (NEMSIS) effort has been a key to our data standardization effort this year.

## Data Confidentiality

MIEMSS maintains or has access to eight confidential databases used in ensuring quality EMS care delivery. The Data Access and Research Committee (DARC) was formed to ensure that all data and information requests were expedited efficiently and accurately, while ensuring patient and provider confidentiality at all times. Since January 2000, over 1200 requests have been tracked and facilitated. Profiles of requestor, types, format, and content are reviewed at the end of each year so that MIEMSS' routine, non-confidential reports are modified to better meet the most common needs of data requestors.

## REGIONAL PROGRAMS & EMERGENCY OPERATIONS (FIELD OPERATIONS)

Regional Programs consists of five offices located throughout the state. Each office consists of at least one regional administrator and a secretary. They are responsible for monitoring the operation of the EMS system in their area and acting as an advocate for the services in their region in the development of state policies and as the MIEMSS representative to institute and maintain those policies. 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 administrative representatives on the scene. Because of the expansion of these expectations, Regional Programs and Emergency Operations

were merged this year, providing the regional administrators more direct input into the strategic planning for disaster response.

The general functions of the five offices are very similar, but because of demographic and geographic variations across the state, the individual duties of regional administrators can differ tremendously. Some work through the strong local administrations, while others must assist each individual company or provider to effect their assignments. The chart in Figure 1 shows the distribution of general activities in FY 2006 based on the number of events attended.

## Grants to Local Jurisdictions

Support to the local jurisdictions from MIEMSS comes in many forms. One of the most obvious is funding some of the money from the state budget for ALS and EMD training and for patient care devices and communications equipment. Other funds are from federal programs targeted for specific purposes, such as highway safety and bioterrorism planning and response. With direction from the Office of Finance, the regional offices work through the Regional EMS Advisory Councils and the Regional Affairs Committee of the Statewide EMS Advisory Council (SEMSAC) to prioritize, distribute, and track the progress of the grants. Figure 2 shows the distribution of those funds during FY 2006. The Regional staff is also responsible for inventorying all assets gained from the grants.

The 50/50 matching funds provide matching grants to local jurisdictions for monitor defibrillators, automated external defibrillators, and other

Figure 1—General Activities

## Regional Office Activities

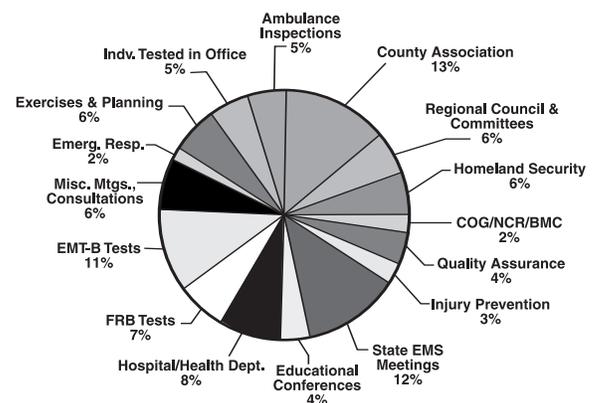


Figure 2–Grant Summary

	50/50 Matching Equipment Funds	ALS Training Funds	Emergency Dispatch Programs	HRSA Bioterrorism Grants	DOT Highway Safety Grants	Rural AED Programs	Total By Region
Region I	\$27,215	\$19,509	\$2,350	\$26,666	\$20,000	\$9,948	\$105,688
Region II	\$56,407	\$16,890	\$6,335	\$48,880	\$20,000	\$19,896	\$168,408
Region III	\$118,588	\$111,298	\$11,910	\$147,000	\$20,000	\$20,301	\$429,097
Region IV	\$95,946	\$78,812	\$14,532	\$119,970	\$20,000	\$69,636	\$398,896
Region V	\$103,657	\$81,675	\$14,387	\$97,764	\$20,000	\$19,896	\$337,379
<b>Total</b>	<b>\$401,813</b>	<b>\$308,184</b>	<b>\$49,514</b>	<b>\$440,280</b>	<b>\$100,000</b>	<b>\$139,677</b>	<b>\$1,439,468</b>

diagnostic and patient care equipment. There is a mechanism to provide full funding should a company experience financial hardship.

ALS training funds are distributed to the local jurisdictions to support initial advanced life support licensure and continuing education courses. Similarly, the Emergency Medical Dispatch funds provide funding to support EMD training, recertification, and quality assurance.

Health Resources Services Administration (HRSA) funds directed at preparing a response to bioterrorism events were awarded to several jurisdictions. Below are some of the ways those funds were used. All regions benefited from the funds with similar projects.

- The MIEMSS Bioterrorism Collaborative Grant with hospitals was implemented to provide protective provider equipment (PPE) equipment for all ambulances in Allegany and Garrett counties (Region I).
- Equipment purchased through Bioterrorism Sub-Grants awarded to Region II includes mass casualty trailers that will deliver medical supplies to treat 100, 50, or 25 patients, portable shelters that include heating and air conditioning for secondary treatment areas, and decontamination equipment for use by hospitals and county public safety agencies. This most recent grant provides equipment to individual fire and EMS companies that are the first-line units that arrive on the incident scene. This grant will provide every medic unit in the region a triage fanny pack for triaging patients, EMS command vests, command boards, treatment area flags, colored tarps, and accountability forms to track patients in an orderly manner. Every first response vehicle, engine, rescue squad, truck, and ambulance in Region II will also receive a triage fanny pack.

- Region V purchased triage tags for all the hospitals and apparatus in the region. All regions benefited from the funds with similar projects.

Federal Department of Transportation (DOT) EMS funds are distributed by MIEMSS in Maryland. These projects include support for community safety programs, extrication tools, patient care equipment, and crash preparedness programs.

Along with providing automated external defibrillators (AEDs) to less populated areas all around the state, the Federal Rural Health funds, distributed by the HRSA and managed by MIEMSS with the assistance of the Regional Offices, assisted in providing training programs and equipment in the Hancock and Emmitsburg areas of Region II. In Region IV, Dorchester County was honored this year for placing AEDs in all public schools, joining Talbot and Caroline counties, prior to the recent passage of legislation regarding placement of AEDs in all public high schools throughout the state.

### Programmatic Assessments

The Regional Offices coordinate comprehensive assessments of the local EMS programs where requested. In conjunction with the MIEMSS State EMS Medical Director, Dr. Richard Alcorta, Strengths, Weaknesses, Opportunities, and Threats (SWOT) analyses were conducted in three jurisdictions this year. The analyses result in short- and long-term plans for the advancement of emergency services in the counties. Region I coordinated SWOT analyses in Allegany and Garrett counties. Reports were presented in Garrett County in late February and in Allegany County in early May to the respective sets of County Commissioners. The reports were accepted, and the process has begun for their implementation in each of the counties. Region IV coordinated a

SWOT analysis for Kent County which produced a written report to the Commissioners and a presentation to the general public. Efforts are currently underway to implement the recommendations of the SWOT. The Commissioners have approved the expansion of two additional rapid response units in Kent County.

**Voluntary Ambulance Inspection Program—Seal of Excellence**

Regional Programs is responsible for administering the Voluntary Ambulance Inspection Program (VAIP), which attempts to ensure that all ambulances meet a minimal level of safety and equipment inventory. Participating companies must have their equipment and vehicles assessed every other year. The Region I Office conducted ambulance inspections on 22 ambulances in Allegany County, in coordination with the Allegany County Fire & Rescue Board. Garrett County should be completed next year. In Region II, both Frederick and Washington counties have adopted the VAIP as the standard for their annual inspection of vehicles providing EMS services. Region II conducted 58 inspections this year. Voluntary ambulance inspections also continued throughout the year in Region III. Over 100 vehicles were inspected in Harford and Carroll counties. Additional individual unit inspections were performed upon request in Baltimore County and at BWI Fire & Rescue. The MIEMSS Region IV administrators inspected 42 prehospital emergency response vehicles throughout the Eastern Shore, including advanced and basic life support ambulances, chase cars, paramedic engines, and first responder units. Region V inspected all the ambu-

lances and multiple first responder units in Charles County, along with multiple other inspections in the counties making up Region V. Figure 3 reveals the current status of those participating in the program.

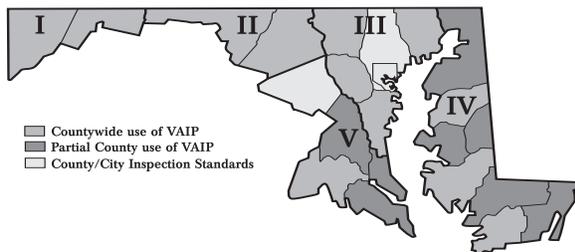
**Electronic Maryland Ambulance Information System (EMAIS)**

The Electronic Maryland Ambulance Information System (EMAIS) is the new electronic patient care reporting system offered by MIEMSS. The Regional Offices assist in the implementation by encouraging its use and scheduling training programs. Since Frederick County Department of Fire and Rescue Services implemented the EMAIS, they have experienced very little problems. All their stations are utilizing EMAIS, including the federal fire station on Fort Detrick. Washington County EMS providers continue to use EMAIS with growing success. The EMAIS reports are useful in identifying quality improvement issues. These reports identify trends with patient care and in the EMS system. This allows the jurisdiction to recognize issues in a quick manner, ultimately improving patient care within the county.

Participation in the program continued its expansion in Region III with the inclusion of Carroll County, Annapolis City, BWI Fire and Rescue, and the MSP Aviation Command. The Region III Office has continued to assist as a liaison for EMAIS issues. Eight of the nine jurisdictions in Region IV and three jurisdictions in Region V are participating in the program. The remaining jurisdiction on the Eastern Shore is also implementing an electronic reporting system from a private vendor and plans to submit data to MIEMSS electronically.

Figure 3—VAIP Participation

**Counties in Maryland Using New VAIP Criteria**  
(As of June 30, 2006)



Region	BLS First Response	BLS Ambulance	ALS Chase Car	ALS Engine	ALS Ambulance
I	0	1	2	2	25
II	44	37	21	1	24
III	90	14	8	0	61
IV	6	18	25	3	117
V	11	32	9	0	2
<b>TOTAL</b>	<b>151</b>	<b>102</b>	<b>65</b>	<b>6</b>	<b>229</b>

**Health & Medical Emergency Preparedness**

MIEMSS continues its commitment to strategic planning for natural and man-made disasters through the Health and Medical Committee of the Governors Emergency Management Advisory Council (GEMAC). The EMS Disaster Focus Group developed a draft Mass Casualty/Catastrophic Incident Plan. This plan attempts to organize mutual-aid response across the state into three phases and will also help to assist in coordination of assistance to other states. MIEMSS produced a draft Health Care Facility Evacuation Plan detailing the assistance MIEMSS will offer.

The State Legislature passed House Bill 770 requiring all healthcare facilities to have their own emergency plans and directed the Maryland Department of Health and Mental Hygiene to determine the required elements of such plans. As a result, a Health Care Facility Evacuation Technical Advisory Group (TAG) was formed to identify those elements and prepare a plan to ensure the coordination between the facilities and local, state, and federal emergency response organizations. The Personal Protective Equipment/Decontamination TAG continues to attempt to standardize processes, plans, and equipment used during the transfer of patients from field units to hospitals. A survey was published to determine the status of all these items at hospitals. They are also preparing minimum training objectives for hospital-based providers.

In the Fall, the Planning TAG began working with the Governor's Office of Homeland Security to define Maryland's status as it relates to the new U.S. Department of Homeland Security (DHS) list of 36 Target Capabilities. Resources were defined. The activity then shifted to responding to the DHS grant process which required an assessment of those capabilities and an identification of priorities for funding. The GEMAC Health and Medical Committee then became the Governance Group for the DHS-funded Health and Medical grants throughout the state.

The Regional Offices were involved in the regional assessments associated with that grant process. They are also identifying groups in each region that will serve on a regional health and medical emergency preparedness committee. In Regions I and II, the Regional EMS Advisory Councils will serve that function. In Region III, it will be a committee of the EMS Council; in Region IV, the regional Bioterrorism Committees are being expanded to include EMS and hospitals; and in Region V, quarterly meetings of the EMS Advisory Council will be dedicated to the issues. It is hoped that the regional committees will assist in the coordination between neighboring counties and carry local concerns to the statewide planning group.

One of the priorities identified in the assessment of target capabilities was that of information management and redundant communication. The Facilities Resource Emergency Database (FRED) participation is being expanded to allow the alerting of nursing homes and clinics so they may be



more prepared to deal with a regional incident. Issues of patient tracking are being investigated through a pilot program in the National Capital Region (NCR) being funded through an NCR Urban Area Security Initiative (UASI) grant. Work has also begun to improve the interfaces between FRED, the County and Hospital Alert Tracking System (CHATS), patient tracking systems, and the Web EOC application managed by the Maryland Emergency Management Agency (MEMA).

### **Chempack Stockpiles**

Through the Centers for Disease Control, Strategic National Stockpile Program, the State of Maryland received 23 EMS and 12 hospital containers of antidotes for chemical-related incidents. Each container contains enough medications to treat 500 to 1000 affected patients. The Regional Offices assisted in the determination of strategic placement locations around the state and began efforts with local authorities to plan for rapid deployment and transportation should such an incident occur. The Region V Office gathered the reports for EMRC's use and is working on educational programs to make all responders aware of their availability.

### **Exercises**

Jurisdictional weapons of mass destruction (WMD) response and mass casualty planning efforts continued throughout the state with the participation and support of the Regional Offices.

MIEMSS is a member of the MEMA Exercise and Training Integration group which is beginning to coordinate the objectives of all the exercises in the state. Maryland has adopted the DHS Homeland Security Exercise and Evaluation Program (HSEEP) as a model for planning and conducting these drills.

The Region I Office participated in planning and conducting a WMD Disaster Drill in Garrett County. The drill included both tabletop and field exercises, along with extensive triage tag training for prehospital providers.

The Region II staff continues to be heavily involved in disaster preparation across the State at the local, regional, and State levels. The office has provided assistance on mass casualty exercise planning and implementation through both presentations and guidance. The concept of interagency cooperation and communication and principles of continuous quality improvement have been integrated into the design of mass casualty exercises so that each is evaluated, and the resulting data are used to further increase response capability and improve operations. Templates for drill organization and presentation have been developed

that will allow local and regional groups to utilize proven processes and evaluation tools. A package that includes flow charts, victim and provider accountability, and other management and training tools, as well as loaner vests, has been made available throughout the State. The Region II Administrator and his Office have actively participated and assisted 11 jurisdictions across the State with the planning, evaluation process, the organization of moulage, and the development of victim injury cards for their exercises. Frederick Memorial Hospital has conducted drills throughout the year to plan for WMD events (involving HAZMAT and decontamination of patients), as well as its routine, annual mass casualty management drills.

In the fall, the Region III Office assisted with the planning and execution of the third annual bioterrorism exercise sponsored by the Baltimore City Health Department, Harbor Base III. Several more focused exercises also took place in local jurisdictions throughout the year which were also supported by the Region III Office. M&T Bank Stadium conducted a tabletop evacuation exercise in the fall to test their emergency operations plan,



while Baltimore County hosted a "Road Rescue" exercise in June to test their abilities to respond to a mass casualty hazardous materials incident on a local highway. Baltimore City exercised similar capabilities during a simulated incident at the Fort McHenry Tunnel. Of particular note in Region III is the National Disaster Medical System (NDMS) Reception Exercise. This exercise involved the cooperation of multiple organizations, including MIEMSS, the National Study Center for Trauma and EMS, the NDMS Federal Coordinating Center at Walter Reed, MEMA, and BWI Thurgood Marshall Airport. Conducted in the spring of 2006, it simulated the reception of injured patients from either a military conflict or distant disaster. Mutual-aid units and hospitals from Regions III, IV, and V participated in this multi-disciplinary exercise. The results of the exercise will be a single renewed agreement between NDMS and the State of Maryland and a specific plan for responding to such an incident.

Exercises in Region V included the Jester Tabletop Exercise to test Montgomery County hospitals' abilities to respond to a bioterrorism incident. An exercise designed to test the cooperation between the Montgomery County hospitals when faced with a countywide catastrophic incident was also conducted. This exercise included testing agreements between Suburban Hospital and the National Naval Medical Center and the National Institutes of Health. Charles County hosted a countywide emergency response exercise, and Suburban Hospital hosted a tabletop exercise to practice the receipt of the strategic National Stockpile. Prince Georges County coordinated an exercise at FedEx Field in Lanham.

### **Emergency Responses/EOC Activations/FRED Alerts**

The Facility Resource Emergency Database (FRED) was used 28 times this year to alert the EMS and healthcare community of incidents around the state. MIEMSS personnel responded to eight incidents to assist in the coordination of resources. Probably the most notable of these is the Maryland Response to Hurricane Katrina. The Deputy Director of Field Operations was detailed to the Governor's Office of Homeland Security and sent to Louisiana to identify how Maryland could assist and then facilitate formal requests through the Emergency Management Assistance Compact process. The resulting request for med-

ical care mobilized the Regional Administrators and the Field Operations Support Team to determine who was available to respond and to assemble the logistics for those responders. During the course of the three-week operation, 89 EMS personnel, 19 EMS vehicles, and 7 logistic support vehicles were deployed to Jefferson Parish near New Orleans. Once there, they supported 6 community care clinics, along with personnel for the Maryland Professional Volunteer Corps and the Maryland Defense Force. They provided care to over 6000 patients before returning after three weeks of deployment.

Some of the other responses included assistance in the National Disaster Areas in Caroline and Dorchester counties of Maryland following heavy rains in late June, the crash of a bus in Baltimore County with 30 out-of-town deaf students, a potential infectious disease on an international flight arriving at BWI Thurgood Marshall Airport, two incidents involving carbon monoxide poisoning in public buildings, suspicious street drugs, and planned events such as the President's State of the Union Address.

### **Conferences**

Individual EMS providers are required to complete continuing education. Pre-programmed courses are available throughout the state, but in an effort to bring the most up-to-date information, the regional offices cooperate with educators from the region to provide quality programs in a conference format. This also facilitates the networking of conference participants with their colleagues from around the state.

In Region I, the Miltenberger Emergency Services Seminar was held on March 11, 2006, at Rocky Gap Lodge and Golf Resort. In excess of 325 individuals attended this program, including prehospital EMS, fire, and nursing personnel.

Maryland's annual statewide EMS continuing education conference, EMS Care, was hosted by Region III in April. The four-day conference provided more than 60 hours of continuing education credits to EMS providers from across Maryland. In addition to instruction in specialized areas of pediatrics, response to mass casualty and hazardous materials incidents, and various other trauma and medically related areas of instruction, the first Quality Assurance Officer's course was piloted, designed to provide local QA Officers with the tools necessary to promote continuous quality



assurance and improvement practices statewide. As an added highlight, EMS Care welcomed nationally recognized cardiologist Dr. Joseph Ornato as the conference's keynote speaker. He updated attendees on the science behind the 2005 American Heart Association changes to the Emergency Cardiac Care Guidelines.

Two very successful conferences were held in Region IV. The Winterfest Conference in Tilghman completed its ninth year, and the Peninsula Regional Medical Center hosted its 15th Trauma Conference in Ocean City. Plans are already underway for next year's conferences.

Pyramid 2005, the seventeenth annual Tri-County EMS Conference, was conducted in conjunction with the Emergency Education Council of Region V, Inc. Held at the Holiday Inn and Conference Center in Solomons, Maryland, the October conference had over 200 registrants.

### **Certification Examinations**

The Regional Offices administer most of the written Maryland certification exams for EMS pre-hospital providers. Each office cooperates with the MIEMSS Office of Licensure and Certification and the multiple educational programs throughout the State to schedule the exams and ensure appropriate sites for the testing. This year the offices conducted examinations for 78 First Responder classes and 129 EMT-B classes and tested multiple individual students in the regional offices.

### **Quality Improvement**

Each Region has designated Regional Quality Review Committees or Councils. They incorporate the Medical Directors, jurisdictional representa-

tives, and EMS organizations to conduct audits for quality improvement and discuss issues or initiatives and explore new ideas and technology that could affect or benefit the quality of patient care throughout each region. They strongly supported the development of Quality Councils in each county and supported quality management education and implementation. They all participate in the Regional Jurisdictional Quality Improvement Council (QIC) staffed by the Region V office. This QIC developed and presented the first QA Officer Course at EMS Care 2006.

### **Region-Specific Activities**

In addition to some of the common activities described previously in this report, each office embarked on projects to address the unique needs of their area or utilized their expertise for statewide projects. Following is a review of some of their projects.

#### ***Region I—Allegany & Garret Counties***

The MIEMSS Region I Office completed and submitted a Staff for Adequate Fire & Emergency Response (SAFER) Grant request to the Department of Homeland Security for funding a volunteer recruitment program in Allegany and Garrett counties. The project, if funded, will provide for a volunteer recruitment retention coordinator, promotional materials, and implementation of an organized volunteer recruitment plan.

The Regional Office staffed the statewide committee that updated the Maryland Voluntary Ambulance Inspection Program—Seal of Excellence. The program received endorsement from the State Regional Medical Directors and ensured that all units receiving Seals of Excellence will be able to provide all the procedures called for in the *Maryland Medical Protocols for EMS Providers*.

The Region implemented Triage Tag Day to familiarize all EMS and hospital personnel with the tag.

The Region I Office completed the second year of the Bystander Care Grant, a pilot project funded by the Maryland Office of Highway Safety. The purpose of the program is to train drivers in rural areas on what to do if they are the first to come upon a vehicle crash. Al Ward is coordinating the program and has expanded its outreach to Carroll, Frederick, and Washington counties.

***Region II—Frederick & Washington Counties***

Region II has taken the lead for MIEMSS on the Maryland Virtual Emergency Response System (MVERS) Project. This system provides an electronic plan that allows quick and easy access to information in order to expedite a response to a critical situation. MVERS has been developed and managed cooperatively between MIEMSS, the Maryland State Police (MSP), and the Maryland Emergency Management Agency (MEMA). The Region II Administrator, along with other MIEMSS staff and representatives from the three participating agencies, provide training and technical assistance to organizations implementing the program. The Maryland State Police has received Patriot Grant Funds to provide support for the implementation of MVERS. The funds have been utilized for data gathering and to purchase three additional sets of equipment, including a camera, 360-degree lens, tripod, and computer and appropriate software, to loan out to jurisdictions to implement the MVERS project. The Region II Office also has been working closely with its partners, the Governor's Office of Homeland Security and the Department of General Services Police, to complete the MVERS program for the State House and the Annapolis building complex. While MIEMSS, through its EMS for Children

program, will focus on implementing MVERS in schools, the program and training will be made available to any agency/organization upon request.

The Washington County Volunteer Fire & Rescue Association has employed an EMS Management Specialist since 2000. On July 24, 2006, this position was titled "EMS Coordinator" and was moved under Washington County Government's Department of Fire & Emergency Services. Washington County now has a representative to the County Government and Commissioners; this creates the foundation and solid structure to enable EMS system growth to meet the community needs and to begin effecting changes and progressive, proactive approaches to service delivery and quality patient care. It also gives Washington County EMS one agency to be responsive to and work in a collaborative effort to provide excellent care in a patient-oriented, consumer-driven approach—meeting or exceeding local, state, and national standards.

The Region II Office continues to be a member of and support the Tri-Sate Healthcare Coalition, which includes hospitals and health departments from Maryland, Pennsylvania, and West Virginia. This coalition is in the final stages of developing a memorandum of understanding



that would allow organizations to share resources, information, and personnel not only between counties but across state lines. This memorandum of understanding is scheduled to be signed between coalition members in the fall of 2006.

The Region II Office and the Mid-Maryland EMS Advisory Council members mourn the passing of one of their own. On March 13, 2006, Edgar Crist, President of the Region II EMS Advisory Council, succumbed to his long-term illness. Mr. Crist was a member of the Independent Hose Company #1 for 22 years, the United Fire and Steam Company #3, and the Frederick County Volunteer Fire and Rescue Association. He was Past President of the Frederick County Ambulance Association, Past President of the Brunswick Volunteer Fire and Ambulance Company, and Vice President of the Thurmont Volunteer Ambulance Company. He was on the Training committee for Frederick County Volunteer Fire and Rescue Association and was a trained EMT since the 1950s. His enthusiasm and determination to improve the EMS system in Region II will be greatly missed.



***Region III—Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties and Baltimore City***

Region III continued to address the recurring problem of hospital overcrowding. A slight increase in the usage of hospital alert hours was seen, despite the ongoing efforts of areawide hospitals and EMS jurisdictions to enhance hospital throughput processes. A task force was recently assembled by the Baltimore City Fire Department to investigate policy and procedural changes that may offer improvement and alleviate congestion during peak operational periods. It is the goal of Region III to continue to investigate best practices and implement successful procedures identified by this task force in an attempt to address this widespread crisis.

The MIEMSS Region III Office played a very active role in the hospital base station designation/redesignation process. In cooperation with the MIEMSS Offices of the Medical Director and Hospital Programs, Regional Administrators participated in site visits to the majority of Region III's 23 hospital emergency departments, with the expectation that this process will be completed for all regional hospitals by the end of calendar year 2006. This process, combined with the increased number of Hospital Base Station courses throughout Region III, has better equipped emergency departments to provide quality online medical direction to EMS providers and enhanced working relationships between hospital and prehospital personnel, ultimately resulting in a higher overall quality of patient care.

***Region IV—Caroline, Cecil, Dorchester, Kent, Queen Anne, Somerset, Talbot, Wicomico, and Worcester Counties***

The past year was one of new initiatives, expansion of EMS services, expansion of base stations, transition to electronic ambulance reporting, and closer integration and cooperation with health departments and hospitals. In addition, Page Gray joined MIEMSS as the new Associate Administrator in Region IV.

Talbot County EMS celebrated its 20th anniversary of the start of advanced life support services in the Mid-Shore. Cecil County dedicated its new state-of-the-art Emergency Operations Center.

Each of the ALS training centers (that is, Cecil County EMS, Shore Health System/Chesapeake

College, and Peninsula Regional Medical Center/Wor-Wic Community College) completed paramedic or intermediate training classes. Continuing education courses were held to recertify BLS and ALS providers. In addition, a total of 15 EMT-B programs and 5 First Responder programs were completed.

The Edward W. McCready Memorial Hospital was approved as a new base station consultation center and is now providing EMS consultation to prehospital providers in Somerset County. After site surveys and visits by the State EMS Medical Director, Richard Alcorta, MD, all other hospitals in the region were renewed as consultation centers. The Regional Office assisted in the Base Station planning and training within the hospitals, and all seven regional hospitals provide EMS consultation to prehospital providers.

The Region IV EMS Advisory Council updated its by-laws to add a Health Department representative and modified its Alert Policy. The increased interface with the health departments has facilitated the exchange of information and cooperation and provided a mechanism for a Health and Medical Committee.

#### **Region V—Calvert, Charles, Montgomery, Prince George’s, and St. Mary’s Counties**

Region V continues to support a variety of education and prevention activities through the Region V EMS Advisory Council, county fire and rescue associations, and the EMS for Children Risk Watch® initiative. In addition, the Office has worked with DHMH and injury prevention groups across the State to form the Partnership for a Safer Maryland, an advocacy group.

Bioterrorism/WMD planning has been a major focal point of efforts throughout the Region. Both Montgomery County hospitals and health-care facilities and those in Prince George’s County have entered into a Memorandum of Understanding (MOU) to cover resource sharing during emergencies, and those groups have provided models for a statewide agreement. The tri-county area of Southern Maryland has begun development of a similar MOU. Federal, state, and local funds have been utilized to improve response capability. Region V is also working closely with the National Capital Region through the Metropolitan Washington Council of Governments to improve metropolitan area response. Two Bioterrorism/WMD Forums,

including EMS, emergency management, hospitals, and health department personnel, were conducted.

Region V staff regularly meet with the Montgomery County EMS Advisory Council, the Calvert County EMS Advisory Council, the Charles County EMS Association, the Charles County EMS Chiefs, the St. Mary’s County Ambulance and Rescue Association, the Prince George’s County Firemen’s Association, the Southern Maryland Firemen’s Association, the Prince George’s County Health Care Coalition, the Montgomery County Health Care Collaborative, the Metropolitan Washington Council of Governments EMS Sub-Committee, the NCR Planning Committee, Prince George’s County SAFE KIDS, Maryland SAFE KIDS, the Emergency Education Council of Region V, Inc., and the Region V EMS Advisory Council.

## **STATE OFFICE OF COMMERCIAL AMBULANCE LICENSING AND REGULATION**

*Mission: To provide leadership and direction regarding the commercial (private) ambulance industry in Maryland to protect the health, safety, and welfare of persons 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:**

- 61 semi-annual vehicle licenses issued in December 2005
- 262 annual vehicle licenses issued in June 2006
- 36 vehicle addition inspections conducted
- 16 license transfer inspections conducted
- 83 routine compliance inspections conducted
- 12 complaint investigations conducted
- 31 ground ambulance service licenses issued (6 BLS services and 25 ALS services)
- 3 air ambulance service licenses issued

FY 2006 marked the thirteenth year of operation for the State Office of Commercial Ambulance Licensing and Regulation (SOCALR). In addition to carrying out its mission of ensuring

patient and provider health, safety, and welfare, the Office continued its efforts to optimize commercial EMS' efficiency and effectiveness of care in order to maintain alignment with MIEMSS' statewide vision for the EMS system.

Overall, the status of the commercial ambulance industry during FY 2006 can be described as one of "steady state." Although the number of services dropped slightly from 33 to 31 (6% decrease), there was modest growth in the number of vehicles from 254 overall to 262 (3% increase). Within the vehicle categories, ALS vehicles dropped in number from 116 to 105, while BLS vehicles increased in number from 131 to 148. This 13% increase in BLS vehicles balanced the 9% decrease in the ALS category.

In addition to the activities described above, the Office continued progress on four core initiatives. Foremost, progress continued on applying the Specialty Care Transport regulations, the intent of which is to establish a cadre of specially prepared paramedics and a protocol allowing them to transport critically ill patients who meet rigid criteria. In accordance with State Government Article, §§10-130–10-139, Annotated Code of Maryland, the Office completed the first phase of a regulatory review of COMAR 30.09. Executive Order 01.01.2003.20 requires State agencies to review their regulations every eight years to determine whether the regulations continue to be relevant and necessary for the public interest.

Progress similarly continued on two long-term initiatives assigned to the office under the EMS Plan. First, staff sought input on the many aspects of ambulance safety from national organizations and agencies such as the Federal Interagency Committee on EMS (FICEMS) ambulance safety subcommittee, the Centers for Disease Control's

National Institute of Occupational Safety and Health (CDC/NIOSH), and the American Ambulance Association (AAA). These subject matter experts were instrumental in focusing efforts of office staff to mitigate hazards faced by patients and providers in commercial EMS.

Additionally, SOCALR continued working to facilitate commercial EMS' contribution to disaster response. Office staff participated on the MIEMSS Field Operations Support Team and facilitated significant commercial ambulance involvement in Operation Lifeline, a 1300-mile, cross-country mission providing critical EMS infrastructure to the devastated New Orleans region. On the home front, SOCALR and commercial services provided support in three Region III disaster response exercises—most notably, a full-scale, multi-jurisdictional exercise at BWI Thurgood Marshall Airport in which military, state, and local governments participated. The exercise provided insight and understanding on mass evacuation from distant regions.

In summary, consistent with the overall mission of the Agency, SOCALR continued to provide leadership in issues related to clinical care, education, healthcare policy, and system operations. SOCALR will continue efforts toward the regulatory review, thereby ensuring that the commercial ambulance regulations remain relevant and reflective of state-of-the-art practices in interfacility transport. Similarly, it will continue to advocate for and contribute to the creation of objective, rigorously reviewed, and scientifically valid standards for patient and provider protection, within the context of high-quality commercial EMS operations. Finally, it will continue to support planning, organizing, providing, and evaluating the role of commercial EMS in disaster response.

# 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 the next page.)

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**

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

### **Level III Trauma Centers**

Washington County Hospital, Hagerstown  
Western Maryland Health System, Memorial Campus  
Peninsula Regional Medical Center, Salisbury

## **SPECIALTY REFERRAL CENTERS**

### **Burns**

Baltimore Regional Burn Center/The Johns Hopkins Bayview Medical Center, Baltimore City  
Burn Center/Washington Hospital Center, Washington, DC

### **Eye Trauma**

Wilmer Eye Institute's Emergency Service/The Johns Hopkins Hospital, Baltimore City

### **Hand/Upper Extremity Trauma**

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

### **Hyperbaric Medicine**

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

### **Perinatal Referral Centers**

Anne Arundel Medical Center  
Franklin Square Hospital Center  
Greater Baltimore Medical Center  
Holy Cross Hospital  
Howard County General Hospital  
Johns Hopkins Bayview Medical Center  
Johns Hopkins Hospital  
Mercy Medical Center  
Prince George's Hospital Center  
St. Agnes Health Care  
St. Joseph Medical Center  
Shady Grove Adventist Hospital  
Sinai Hospital of Baltimore  
University of Maryland Medical System

### **Poison Consultation Center**

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



## 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 6,119 trauma patients from June 2005 to May 2006, according to the Maryland Adult Trauma Registry. (See pages 54 to 63 for additional patient data in various categories.) Thomas M. Scalea, MD, FACS, FCCM, serves as the Physician-in-Chief for the Program in Trauma, and Robbi Hartsock, RN, MSN, CRNP, as the Trauma Nurse Coordinator.*

Shock Trauma Center staff were very active in prehospital EMS educational activities. Tours were given to 54 groups. Evening educational programs open to prehospital care providers were held quarterly and linked to broadcasts in Cumberland, the Peninsula Regional Medical Center in Salisbury, Cecil County ALS, and the Maryland Fire & Rescue Institute in College Park. There were 114 EMS providers who participated in 11 ALS Airway Skills Labs. In the Observation Program, 214 EMS providers observed in the Trauma

Resuscitation Unit, and 134 EMS providers in Critical Care. In addition, 56 on-site clinical programs were held at firehouses, training academies, and EMS conferences.

The Research Program at the Shock Trauma Center is an integrated multi-disciplinary program that seeks to answer important questions concerning issues affecting trauma patients. The R Adams Cowley Shock Trauma Center researchers participate in large national and international multi-institutional projects, and are conducting projects funded by the National Institutes of Health, the Department of Defense, and various industry sponsors.

In the area of clinical research, the R Adams Cowley Shock Trauma Center:

- Has collaborated with the Department of Pathology to help the University of Maryland, Baltimore become a Core Center in the Transfusion Medicine/Hemostasis Research Network by the National Heart Lung and Blood Institute (NHLBI). In collaboration with the Department of Pathology, the Shock Trauma Center is conducting research projects aimed at "Reducing Mortality from Acute Hemorrhage in Trauma," by studying methods designed to reduce blood transfusions, control hemorrhage, and reduce mortality in trauma patients.

## 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	

- Developed and tested innovative teaching methods to improve patient safety through better trauma residency training, and better compliance to sterile techniques, through the newly created Patient Safety Research section.
- Is testing a novel system for the assessment of resuscitation in hemorrhaging patients. The Acoustic Resuscitation Monitor (ARM) is a non-invasive device capable of measuring blood flow to the body. It is compact, inexpensive, and suitable for continuous use. Utilizing acoustic technology, the ARM system may represent a revolutionary advance in the diagnosis and care of patients in hemorrhagic shock.
- Is conducting multiple projects pertaining to predictors of infection and outcome in critically injured trauma patients. These studies promise to have an immediate impact on the quality of care in the critical care setting.
- Is participating in an ongoing study seeking to identify biological markers of sepsis in patients' blood, and to validate their ability to detect sepsis 24 hours or more prior to the onset of clinical symptoms. The goal of this study is to develop a clinical assay which will aid in the early diagnosis and management of sepsis.

The Shock Trauma Center provides the leadership for the American Trauma Society (ATS), Maryland Division through its president, Robbi Hartsock, RN. The Maryland ATS continues to provide safety programs and Traumaroo (the children's safety program of the ATS that employs the services of the animated character "Troo" to teach important safety habits, with "fun" as a key component) in schools and communities in all five EMS regions of Maryland.

The Shock Trauma Center Violence Intervention Program (VIP) is designed to identify profiles of patients who are repeat victims of violence in an effort to intervene and disrupt the cycle of violence. The program includes a multidisciplinary approach that combines parole and probation, surgeons, social workers, psychiatrists, nurses, epidemiologists, and physicians who plan care for these patients.

Despite the continued loss of grant funding, the Trauma Prevention Department had a busy year. The purpose of the department is to provide education and awareness of risky behaviors that lead to traumatic injuries. The focus is drunk and drugged driving—consequences and prevention strategies. The program has been in existence for more than 20 years, working with various Maryland counties. It has been a partnership with

various juvenile justice departments, schools, state attorneys offices, and the judicial system. The targeted population includes high-risk teenagers, adult DWI offenders, and the general public. There are three components to this program: on-site, community outreach (for high-risk teens), and general population.

The on-site high-risk teen program at the Shock Trauma Center is provided to four counties: Cecil, Anne Arundel, Frederick, and Howard. A total of 326 teens participated from those counties. Other jurisdictions (Baltimore City, and Baltimore, Carroll, and Montgomery counties) sent an additional 19 teens, bringing the high-risk teen total attendees to 345. Three on-site programs were conducted for students who were members of Students Against Destructive Decisions (SADD) or Students Helping Other People (SHOP).

The teen outreach program goes to high-risk teens in their individual counties. Harford County, Howard County, and Sykesville Shelter in Carroll County are included in the group. Two-hundred teenagers participated in these classes.

Fifteen high-school assemblies were provided, reaching 12,000 students. The assemblies were very well received. Eleven health classes were taught to an additional 200 students.

A similar on-site program is provided to adult DWI offenders. During FY 2006, 231 offenders participated in this program.

The prevention staff attended eight health/safety fairs reaching thousands of Marylanders with prevention education materials. The staff also coordinated a 3-D event at the University of Maryland Medical Center during December, which is Drinking, Drugging, and Driving Awareness Month. Over 1500 people attended and rated it as a huge success.

The prevention staff has participated in various committees and task forces on drunken driving issues. Both staff members have been guest speakers at conferences throughout the state, Aberdeen military base, the Montgomery County Educator's Conference, and WBAL-TV. Both staff are Certified Prevention Professionals.

Positive Alternatives to Dangerous and Destructive Decisions (PADDD) is a 501c3 prevention organization. It was founded by two trauma nurses, Debbie Yohn and Laurel Stiff, who are recognized as Certified Prevention Professionals. PADDD develops and implements educational programs that are designed to prevent impaired and reckless driving. The content is tailored to "at risk" audiences.

Ms. Yohn and Ms. Stiff have taught over 2000 people in their "court ordered" classes. PADDD presentations to judges, high-school students, driving classes, drug courts, the U.S. Military, businesses, and health fair attendees have reached about 7500 people.

PADDD, in conjunction with Karen Barber, Producers Video, and R Adams Cowley Shock Trauma Center, made "It Will Never Happen to Me," a video that focuses on adolescent and young adult drivers with an emphasis on speeding. This video has been presented to 5,000 Marylanders at various locations.

PADDD currently is involved in educational activities around the state and has been featured on Channel 45, Street Talk which is carried on cable in three different markets in Maryland.

PADDD participates in the IDC Task Force, MAPPA, Crash Coalition, Partnership for a Safer Maryland, and the Young Driver Task Force. It is funded through educational fees and receives a grant from the Maryland Highway Safety Office.

### **Level I**

#### **The Johns Hopkins Hospital, Adult Trauma Center**

*Located in Baltimore City, the Johns Hopkins Hospital Adult Trauma Center reported receiving 1,900 trauma patients from June 2005 to May 2006, according to the Maryland Adult Trauma Registry. (See pages 54 to 63 for additional patient data in various categories.) Edward Cornwell III, MD, FACS, FCCM, serves as Director of the Johns Hopkins Hospital Adult Trauma Service, and Kathy Noll, MSN, is the Trauma Program Manager. David Efron, MD, and Elliott Haut, MD, are the division's full-time trauma surgeons. Adil Haider, MD, MPH, is the first Adult Trauma Service Fellow. David Chang, PhD, MPH, MBA, is Research Associate with the Department of Surgery.*

The Johns Hopkins Hospital Adult Trauma Center, housed in the "#1 Hospital in America" according to the *U.S. News & World Report's* rankings for the past 16 years (1991–2006), receives, on average, about 2000 adult trauma patients per year. The Adult Trauma Service continues to provide 24-hour a day in-house trauma attending surgeon coverage. Improved survival, triage time, and length of stay among critically injured patients have been documented with this approach (*Archives of Surgery, 2003*).

The Johns Hopkins Hospital, Division of Adult Trauma, has a strong commitment to trauma prevention, particularly in the area of youth violence. During the past fiscal year, the Division of Adult Trauma continued its involvement in several important trauma prevention endeavors. The Hopkins Injury Prevention and Community Outreach Collaborative (HIPCOC), which was established in 2000 by Dr. Edward Cornwell (the current director of the Adult Trauma Service), is a multi-disciplinary group of clinicians, hospitals, and community affairs professionals, public health professionals, and members of the community, who are interested in pursuing violence prevention through education and outreach activities.

During this past fiscal year, HIPCOC continued to conduct several ongoing prevention programs, including the dissemination of videos aimed at adolescents by depicting the true consequences of gun violence; hospital tours to visit the survivors of interpersonal violence; and slide presentations by healthcare professionals graphically demonstrating the anatomic damage that results from interpersonal violence. The results of this program with the first 97 youths, demonstrated a decreased likelihood toward conflict and aggression that was quantifiable; results of the study have been published in the *Journal of the American College of Surgeons*. In addition, as part of the HIPCOC initiative, and with a grant from the American Trauma Society, the Division of Adult Trauma completed a "readiness to change" study for injured patients ages 15 to 24 who have positive toxicology screens for drugs or alcohol. The results of this study were published in the *Journal of Trauma*.

As part of his many trauma prevention activities, Dr. Cornwell continued his membership on the Board of the American Trauma Society (Maryland chapter), and he is a member of the Committee on Trauma of the American College of Surgeons. Dr. Cornwell also works with the Fort Worthington Police Athletic League (PAL) center and New Song Community Learning Center in the Sandtown neighborhood of West Baltimore.

During the past fiscal year, the Division of Adult Trauma continued to be actively involved within the trauma community at both the state and national levels. Doctor Cornwell is a member of the Executive Committee of TraumaNet, and the Committee on Trauma of the American College of Surgeons. Dr. Cornwell was newly appointed to the State EMS Advisory Board,

which is appointed by and serves in an advisory capacity to the Governor. The Division of Adult Trauma also continues to provide educational and community outreach, and participates in numerous grand rounds presentations. The Division also provides educational offerings to diverse groups, including area school children, college students, EMS personnel, trauma clinicians, church congregations, and rotary clubs.

Kathy Noll, MSN, Trauma Program Manager, is a member of TraumaNet, the Maryland Trauma Registry, Education and Injury Prevention Committee (MTREP) and the Maryland Trauma Quality Improvement Committee (QIC). Ms. Noll was appointed as Maryland State Chair of the Society of Trauma Nurses (STN) in 2006, and has completed the Advanced Trauma Care for Nurses (ATCN) course sponsored by STN. She is a Certified Emergency Nurse (CEN), and a member of the Emergency Nurses Association (ENA). Ms. Noll is committed to maintaining quality for the division's trauma program through participation in monthly mortality and morbidity conferences and through her involvement in the trauma multi-disciplinary performance improvement committee as its co-chair. She regularly lectures in the hospital's trauma orientation course for nurses. She has been active in injury prevention as a member of the steering committee/Partnership for a Safer Maryland (PSM), whose mission is to advocate for injury and violence prevention and to promote education and surveillance in Maryland through statewide partnerships. PSM will be focusing on a series of campaigns, beginning with Youth Safety, which will raise awareness of injury and violence prevention and incorporate the resources of injury prevention programs within the state.

Dr. Elliott R. Haut was appointed Assistant Professor of Surgery at Johns Hopkins in July 2004 where he plays an active role in the care of trauma, intensive care unit, and general surgical patients. He is a diplomate of the American Board of Surgery and has a Certificate of Added Qualifications in Surgical Critical Care. He directs Performance Improvement for the Adult Trauma Service at Johns Hopkins Hospital. He is an active member of numerous professional organizations, including the Society of Critical Care Medicine (SCCM), the Association for Academic Surgery (AAS), and the Eastern Association for the Surgery of Trauma (EAST). He is also a member of the EAST program committee which sets the agenda and reviews abstracts for the annual scientific meeting.

Dr. Haut has research interests in both trauma and critical care. His ICU research focuses on prevention and treatment of anemia in the Intensive Care Unit. He was awarded the American College of Chest Physicians Young Investigator Award for his presentation entitled "Anemia Management Program (AMP) Reduces Transfusion Rates and Costs in a Surgical Intensive Care Unit: A Prospective Study." His main trauma research interests relate to trauma systems and care delivery models, as well as deep vein thrombosis and pulmonary embolism prevention. He has recently presented at national meetings, including the American Association for the Surgery of Trauma (AAST), the SCCM, and the EAST.

Dr. Haut is heavily involved in education at many levels. He is an Assistant Program Director for the General Surgery Residency at Johns Hopkins Hospital. He is an instructor for both the Advanced Trauma Operative Management (ATOM) course (co-sponsored by Shock Trauma and Johns Hopkins Hospital) and ATLS. Other teaching endeavors include focuses on medical student, resident, and nurse education, as well as instructing at the Johns Hopkins Wilderness Medicine course.

Dr. David Efron has been an Assistant Professor of Surgery at the Johns Hopkins Hospital since July 2004, where he plays an active role in the care of trauma patients as well as general surgery patients. He has been a Surgical Intensivist in the SICU, responsible for clinical teaching at the bedside for surgery and anesthesia fellows and residents, as well as numerous teaching conferences, and he is a reviewer for Practical Reviews in Critical Care Medicine. He has an appointment at the Johns Hopkins University School of Nursing as Assistant Professor of Surgery. Dr. Efron received the Junior Faculty Fellowship grant in July 2005 from the Surgical Infection Society Foundation for Research and Education for his work on the "Mechanism for the Attenuation of the Septic Inflammatory Response Following HMG-CoA Reductase Inhibition." He continues basic science investigation in sepsis and the inflammatory response in critical illness as well as investigation into the protective role that statins may play following traumatic injury. Additionally he has an active interest in urban trauma mortality and recidivism. He was appointed to be Medical Director of Parenteral and Enteral Nutrition Support Services at the Johns Hopkins Hospital in February 2005.

Dr. Adil Haider is the Trauma Fellow and a Clinical Instructor in the Department of Surgery at the Johns Hopkins School of Medicine. Dr. Haider completed his surgical residency in 2005 and his fellowship in Surgical Critical Care in 2006. As a fellow with admitting privileges, he personally manages trauma patients with guidance provided on a daily basis by the more senior trauma surgeons. This is a unique fellowship position where a fully trained surgeon with an additional fellowship in critical care is closely mentored in his first year of practice—allowing the fellow to gain confidence in his skills and to further refine them with the help of mature traumatologists. In addition, Dr. Haider works as a Surgical Intensivist in the SICU, responsible for clinical teaching at the bedside for surgery and anesthesia fellows and residents, as well as numerous teaching conferences. He is also a reviewer for Practical Reviews in Critical Care Medicine.

Dr. Cornwell recruited Dr. Haider to further enhance the division's mission to be at the forefront of injury prevention, trauma outcomes research, and community outreach. Dr. Haider has a Masters of Public Health in Injury Prevention and Trauma Outcomes from the Johns Hopkins Bloomberg School of Public Health. He has already written several journal articles and book chapters and he co-created the Injury Prevention Priority Score (IPPS)—a widely used tool by which individual trauma centers can assess their own local/regional injury prevention priorities. He has received multiple regional, national and international awards for research in trauma. Most recently he was awarded the coveted American College of Surgeons' Excellence in Research Award for work he did in identifying the disparate outcomes that exist between children of different races after traumatic injury.

David Chang, PhD, MPH, MBA, a Clinical Instructor in the Department of Surgery, was trained in health services and outcomes research in the Department of Health Policy and Management in the Johns Hopkins Bloomberg School of Public Health. A member of TraumaNet, Dr. Chang was honored by MIEMSS in May 2005, with the Maryland EMS-Geriatric Award, for his commitment in advancing the delivery of prehospital geriatric emergency care. As an active member of the MIEMSS Geriatric EMS Advisory Committee, Dr. Chang collected and analyzed data on the under-triage of elderly patients to trauma centers, and has led an outreach and intervention program to address this problem by present-

ing the data at several Maryland EMS conferences. At Hopkins, Dr. Chang is the Acting Director for the Johns Hopkins Center for Surgical Trials and Outcomes Research, leading the effort to establish a new research center to support the clinical outcomes research activities in the Department of Surgery.

## **Level II**

### **Johns Hopkins Bayview Medical Center Trauma Center**

*Located in Baltimore City, the trauma center at Johns Hopkins Bayview Medical Center (JHBMC) received 1,497 trauma patients from June 2005 to May 2006, according to the Maryland Adult Trauma Registry. (See pages 54 to 63 for additional patient data in various categories.) Paul Freeswick, MD, FACS, serves as the center's Director, with Robert Dice, RN, MS, as Trauma Coordinator, and Zeina Khoury-Stevens, RN, PhD, as the Nursing Director of Trauma, Burn, and Surgical Care.*

The Trauma Center at Bayview provides comprehensive care to all trauma or burn patients, including treatment for direct injuries and meeting psychosocial, physical, and rehabilitative needs. In FY 2006, the center registered 1,497 patients in the Maryland Adult Trauma Registry, with outcomes data secured in the upper levels of expected outcomes in centers dedicated to the treatment of trauma victims.

JHBMC Trauma is designated as a Level II adult trauma center. The trauma team members and the hospital administrators have dedicated resources and made personal commitments to those areas necessary to provide a successful trauma program. They take pride in this achievement, have reinforced the center's strengths, and bolstered many other areas. This includes the development of a trauma and surgical critical care program. Dr. Kevin Gerold and Dr. Ronald Pauldine, both with training in anesthesiology and critical care medicine, and Dr. Robert Gibson, with training in trauma and critical care, complement this program with their expertise. Several mid-level providers have been hired to expand this program's services.

JHBMC continues its reviews of cases that trigger audit filters. These reviews involve subspecialists from JHBMC (that is, neurosurgeons, orthopedic surgeons, plastic and reconstructive surgeons) who are directly involved with trauma care. Review findings are tracked and trended in the newly acquired Outcomes Registry.

Revised Trauma Alert guidelines have continued to reduce trauma center diversion events. JHBMC Trauma has remained open to receive patients for 98% of available hours each month. In addition, Bayview has adopted the categorization of trauma patients to guide its response to the trauma patient. EMS providers will be asked, in addition to priority designation, the assigned category for each trauma patient during the prehospital radio consultation.

JHBMC continues to focus on its community commitment via its burn education and outreach programs in schools.

The Trauma Service at Bayview continually recognizes the role an aging population has in the evolution of trauma. Given that the JHBMC campus is a world-renowned center for the diagnosis and treatment of the geriatric patient, with the support of the Johns Hopkins Care Center, Bayview's trauma service and its gerontologists combined forces to address the special needs of the elderly trauma patient. This allows for formal medical oversight by the geriatrics and trauma services to provide optimum care to this frail population.

In summary, the JHBMC Trauma Service is a multi-disciplinary unit dedicated to trauma patients of all ages and the community as a whole. It strives to continually assess and improve its services to the citizens of Maryland.

## **Level II**

### **Prince George's Hospital Center**

*Located in Cheverly, the Trauma Center at Prince George's Hospital Center continues to grow. According to the Maryland Adult Trauma Registry, Prince George's Hospital Center received 3,075 trauma patients from June 2005 to May 2006. This is an 11 percent increase in trauma patient volumes from the previous fiscal year. (See pages 54 to 63 for additional patient data in various categories.) Carnell Cooper, MD, serves as the Medical Director and Chief of Trauma Service. Garbiel Ryb, MD, serves as the Assistant Medical Director, Trauma Services. Melissa E. Meyers, RN, BSN, is the Trauma Program Manager, and Sandra Waak, RN, CEN, is the Assistant Department Manager for the Trauma Service.*

The Prince George's Hospital Center (PGHC) continues to serve as the primary adult trauma center for the counties of Prince George's, Calvert, Charles, St. Mary's, and southern Anne Arundel,

as well as parts of Montgomery and Howard counties and the eastern part of Washington, DC. Approximately 30 percent of last year's trauma patients arrived via helicopter. Three flight agencies routinely use the rooftop helipad: the Maryland State Police, United States Park Police, and MedStar.

Dimensions Healthcare System–Prince George's Hospital Center Trauma Center is active in the Prince George's County Healthcare Coalition and the National Capital Region initiative in Emergency/Disaster Preparedness. Due to its close proximity to Washington, DC, the Trauma Center is in the process of developing a system-wide emergency response in the event of a man-made or natural disaster. PGHC is slated to participate in a patient tracking pilot program involving Virginia, Washington, DC, and Prince George's County.

The Trauma Service at PGHC strives to provide optimal quality of care to trauma patients through ongoing Quality Management activities such as daily patient rounds, monthly peer review, and Grand Rounds/Morbidity and Mortality Reviews.

PGHC continues its efforts to improve relationships and communications with prehospital care providers through quarterly EMS Liaison meetings. These meetings also provide an educational forum to address emergency and trauma patient care issues.

For the first time this year, the annual education symposium sponsored by PGHC will be offering a dedicated track for trauma continuing education. The track will be targeting the current care and treatment trends of trauma patients for physicians, nurses, and prehospital care providers in the region.

PGHC has implemented an internal pre-alert status in an effort to improve patient flow through the hospital system. A hospital-wide response is activated when conditions in the Emergency Department reach a near-capacity status with impending Yellow Alert status. The purpose of the pre-alert is to decompress the Emergency Department through the expedition of patient flow through the hospital prior to the need for an actual Yellow Alert activation. The goal is to reduce the total number of alert hours, including Trauma Bypass hours, keeping the doors open to care for seriously injured/ill patients.

## **Level II**

### **Sinai Hospital Trauma Center**

*Located in Baltimore City, the Trauma Center at Sinai Hospital reported receiving 1,748 trauma patients from June 2005 to May 2006, according to the Maryland Adult Trauma Registry. (See pages 54 to 63 for additional patient data in various categories.) Thomas Genuit, MD, MBA, FACS, has served as the Trauma Director since 2003, and Janice Delgiorno, MSN, CCRN, ACNP-BC, served as the Trauma Program Manager until May 2006 and most recently has been replaced by Patricia Lubbert, RN.*

The number and the injury severity of the patients cared for by the Trauma Center at Sinai Hospital of Baltimore have steadily risen over the past five years. To meet this demand, the Trauma Center employs five dedicated Trauma/Critical Care surgeons and many other providers dedicated to trauma care. Most recently, Christian Minshall, MD, from the University of California at San Diego, joined the trauma service as a full-time surgeon, in August 2005. In addition, the Hospital plans to add one or two more full-time Trauma/Critical Care surgeons over the next year to meet the growing demands.

The Trauma Center at Sinai provides comprehensive care to all injured patients from the initial resuscitation through rehabilitation, and quality of care is of utmost importance. Ongoing quality management is provided through weekly trauma case reviews by the Trauma Coordinator and Trauma Director and through monthly departmental morbidity and mortality case review meetings. In addition, the quality of care is continuously improved through close and direct collaboration between various multi-disciplinary departments, functional areas, and teams across the entire hospital.

Trauma Education remained a major focus at Sinai this year. The Trauma Nursing Core Course (TNCC) was implemented at Sinai in August 2005. Presently 47 nurses have successfully completed training, 4 nurses were certified as TNCC Instructors, and 1 was certified as course director. Sinai has hosted 4 TNCC courses, with 4 more scheduled in the upcoming year. Several nurses have also successfully completed the American College of Surgeons' Advanced Trauma Care for Nurses Course (ATCN). All physician providers involved in the acute care of the injured patient are ATLS certified.

As of July 1, 2006, Sinai Hospital was approved by the Accreditation Council for Graduate Medical Education and by the American Board of Surgery for an independent General Surgery Residency Program. Currently 6 residents have joined the program with a planned increase to the full complement of 10 residents by July 2007. All residents will be ATLS certified and receive additional trauma training during their third year at the R Adams Cowley Shock Trauma Center (adults) and the Alfred I. DuPont Children's Hospital (pediatric).

Sinai and its Trauma Center place a high value on maintaining a good relationship with EMS and its providers in the Greater Metropolitan area. To this end, the Division of Trauma and members of the Emergency Department (ER-7) are meeting on a regular basis with EMS leaders, attend the meetings of the EMS Board, Statewide EMS Advisory Council, Region III Advisory Council, and other EMS-related meetings. The Trauma Center providers continue to actively participate in the education of EMS providers through student clerkships and EMS lectures.

Within the State, the Trauma Center maintains active involvement in the Trauma Center Collaborative (TraumaNet) to advance all aspects of trauma care.

## **Level II**

### **Suburban Hospital**

*Located in Bethesda, the Suburban Hospital Trauma Center received 1,433 trauma patients from June 2005 through May 2006, according to the Maryland Adult Trauma Registry. (See pages 54 to 63 for additional patient data in various categories.) Dany Westerband, MD, FACS, serves as the Medical Director of Suburban Hospital's Trauma Services and Anne Kuzas, RN, as its Trauma Program Director. The Trauma Program staff also includes Patricia Baker, RN, as its part-time Trauma Case Reviewer and Michelle Hellmuth, as its full-time Trauma Administrative Coordinator responsible for abstracting and entering data into the trauma registry.*

The Medical Director of Trauma Services and the Trauma Program Director continue to actively participate in the Maryland EMS System through memberships in the American College of Surgeons' Maryland Committee on Trauma, the TraumaNet, the MIEMSS Trauma Quality Improvement Committee, the Region V EMS

Advisory Council, the Statewide EMS Advisory Council, and the Maryland Division of the American Trauma Society. In addition, Anne Kuzas continues to serve as the chairperson of TraumaNet, and Suburban Hospital remains an institutional member of the American Trauma Society.

The Trauma Center and its staff continue to be committed to trauma prevention through participation in community partnerships that strive to educate the public about pedestrian safety, child-related safety issues, and "drinking, drug, and driving" awareness. The hospital administration also provided financial support for several EMS activities during 2006.

A four-hour seminar, "Update on Critical Issues in Trauma," was held in Suburban's main auditorium in February 2006. This program was offered free of charge to the trauma care community within the trauma center's regional area, including medical and hospital staff and EMS personnel. In addition, Suburban Hospital continued to provide trauma training for the registered nurses and corpsmen at National Naval Medical Center in Bethesda. This affiliation was established prior to the deployment of the *USS Comfort* to the Middle East in FY 2003. This program includes both didactic and clinical components and is based on the Maryland Trauma Nursing Orientation Core Curriculum.

The Emergency Department (ED) bed expansion has been completed. A total of nine additional patient care bays were added to the ED, along with a designated secured area for the evaluation and treatment of behavioral health patients. Just prior to this expansion, a new 64-slice CT scan was installed and is now fully integrated within the trauma center's ability to extensively evaluate trauma patients.

Suburban Hospital Healthcare System received outstanding recognition by the National Foundation of Trauma Care as one of five "highly prepared" trauma centers in the United States for disaster preparedness. In that regard, the Hospital's partnership with the National Institutes of Health (NIH) and National Naval Medical Center continues to evolve. This partnership, known as the Bethesda Hospitals' Emergency Preparedness Partnership, was created to refine established processes for handling large-scale natural disasters or terrorist events, as well as to identify areas for improvement in collaboration with local, state, and federal agencies.

Among other accomplishments, the Suburban Hospital-NIH Stroke Center is the first acute stroke treatment program in Montgomery County, and one of only four in Maryland, to receive certification as a Primary Stroke Center from the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). In the Spring of 2006, the Hospital also launched a cardiac surgery program with the opening of its NIH Heart Center after being awarded the certificate-of-need (CON) by the Maryland Health Care Commission.

### **Level III**

#### **Peninsula Regional Medical Center Trauma Center**

*Located in Salisbury, 30 miles west of Ocean City, the Peninsula Regional Medical Center Trauma Center received 1,168 trauma patients from June 2005 to May 2006, according to the Maryland Adult Trauma Registry. (See pages 54 to 63 for additional patient data in various categories.) Un Y. Chin, MD, serves as the Trauma Director, and Teri Wilkinson, RN, BSN, as the Trauma Nurse Coordinator.*

During FY 2006, the official ground-breaking for the expansion of the new critical care tower, the Layfield Tower, took place on May 9. This tower will allow the team of Peninsula Regional Medical Center (PRMC) to continue providing efficient and quality care to the rapidly increasing patient population with a new 51-bed Emergency Department and a 42-bed Intensive Care Unit. The helipad has been relocated to the roof of the Medical Center, but is projected to be placed on the roof of the Layfield Tower after construction is complete to allow for expeditious movement of patients. The projected completion for this expansion is January 2008.

PRMC continues to coordinate and participate in community-based injury initiatives. During the spring of 2006, a group of trauma nurses helped in assisting with mock-crash scenarios during pre-prom presentations at local area 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, the Worcester, Wicomico, and Somerset Highway Advisory Committees, as well as local wellness community events.

Peninsula Regional Medical Center continues to assist in planning, coordinating, and sponsoring

several educational events. A multi-disciplinary group continues to coordinate and sponsor the annual "Topics in Trauma" conference. These topics are applicable to the daily practice of prehospital care to advanced inpatient trauma care. This regional yearly conference continues to attract nurses and EMS providers from Maryland, Delaware, Pennsylvania, and Virginia. PRMC continues to provide educational classes for EMS providers from Worcester, Wicomico, and Somerset counties. Classes for Pediatric Education for Prehospital Providers (PEPP), Prehospital Basic Trauma Life Support (PHBTLS), ALS Paramedic Recertifications/Refreshers, and ALS Skills are just a few of the classes offered.

Peninsula Regional Medical Center continues to promote open communication between the Medical Center and the surrounding EMS community through bi-monthly EMS Advisory Committee meetings. New medical protocols, initiation and implementation of the Electronic Maryland Ambulance Information System (EMAIS) in Somerset and Wicomico counties, and various other topics are discussed through these venues.

Peninsula Regional Heart Center has donated 31 Rosetta Systems to equip all Emergency Medical System (EMS) Advanced Life Support (ALS) ambulances in Wicomico, Worcester, and Somerset counties, respectively. These Rosetta systems allow both the EMS (ALS) provider and the Emergency Department physician and nurse to send and receive 12-lead EKG transmittals from the field in the ambulance to the Emergency Department. This enhances early diagnosis and treatment modalities to begin for the patient prior to arrival to the Emergency Department. Early detection saves heart muscle, and saved heart muscle saves lives.

### **Level III**

#### **Washington County Health Systems Trauma Center**

*Located in Hagerstown, the Washington County Hospital Trauma Center received 938 trauma patients from June 2005 to May 2006, according to the Maryland Adult Trauma Registry. (See pages 54 to 63 for additional patient data in various categories.) Karl P. Riggle, MD, FACS, is the Director of Trauma Services; Marc E. Kross, MD, PhD, FACS, is Surgeon-in-Chief of Trauma Services; and Joan Fortney, RN, BSN, is the Manager of Trauma Services.*

During the past fiscal year, the Trauma Center at Washington County Hospital has provided trauma services to residents of Washington and Frederick counties, Southern Pennsylvania, and the Eastern Panhandle of West Virginia. Vehicle crashes and injuries among the elderly account for the majority of trauma in the tri-state area, and the staff of the Trauma Center focuses on traffic safety and injury prevention programs for the elderly.

Throughout the year, the Trauma Center staff has participated in senior and community health fairs, served as speakers about safety issues, and provided first aid at many community events. In cooperation with SAFE KIDS and other local agencies, several child passenger safety and bicycle safety events have been held throughout the community.

The staff of the Trauma Center continues to provide trauma-related education to physicians, hospital staff, and EMS on a regular basis. The Trauma Center collaborated with Hagerstown Community College to present two multi-disciplinary trauma conferences for trauma providers. Plans are already in progress to continue this semi-annual event in upcoming years. Multi-disciplinary case studies are held on a quarterly basis.

To celebrate the continued contributions and dedication of the trauma center staff throughout the hospital, the Trauma Service again held its annual Trauma Team Recognition Day. A Safety Essay Contest for middle school students in Washington County was held during Trauma Awareness month. The overall winner recorded a radio public safety announcement that was developed from the essays; in addition, prizes were presented to each school winner at a reception for all members of the Trauma Team and the local media. Displays were also set up in the hospital lobby highlighting the essays and their safety messages.

### **Level III**

#### **Western Maryland Health System—Memorial Trauma Center**

*Located in Cumberland, the Western Maryland Trauma Center received 668 patients from June 2005 to May 2006, according to the Maryland Adult Trauma Registry. (See pages 54 to 63 for additional patient data in various categories.) Juan Arrisueno, MD, serves as the Trauma Director; Chuck Barrick, RN, is the Trauma Nurse Coordinator; and Deborah Dayton is the Trauma Registrar.*

With nearly 54 percent of its trauma cases attributable to motor vehicle and motorcycle crashes, the Western Maryland Health System (WMHS)–Memorial Trauma Center focuses much of its community injury prevention efforts on traffic safety and seatbelt use.

WMHS works cooperatively with the Allegany County Health Department, local law enforcement agencies, and other area organizations to promote child passenger safety issues and conduct safety seat checks at various locations in the community. Their efforts also include programs on bicycle safety.

In addition, radio ads are aired in conjunction with major holidays to promote traffic safety and other related holiday safety issues. As part of this campaign, the Trauma Nurse Coordinator does live broadcast interviews about these topics on the morning talk shows on local radio stations.

Staffs from the WMHS–Memorial Trauma Center also participate in the School Safety Council, which brings together the Allegany County Board of Education, law enforcement agencies, the Allegany County Health Department, and the Allegany County Emergency Operations Center to effect a safer school environment. The relationships between the WMHS and these agencies are put to the test in mock disasters that involve bringing school age "patients" to the hospital.

Continuing education is another important component. The telemedicine link between the University of Maryland Shock Trauma Center and the WMHS–Memorial Trauma Center enables physicians, nurses, EMS personnel, and other healthcare providers to participate in classes throughout the year. Staff members also participated in the highly successful Miltenberger Emergency Services Seminar, now held annually in Allegany County and named in memory of Fred Miltenberger, MD, a long-time advocate for Maryland's trauma network. This program offers a variety of topics related to trauma and emergency cases, including a specialized track for nurses. This past year staff offered a Case in Review of a pediatric patient and described the methods implemented in Maryland's intra-facility transfers. The Miltenberger Seminar was again the largest continuing education offering in the state.

Staff from the WMHS–Memorial Trauma Center worked with Maryland State Police Aviation Trooper 5's team to provide education on helicopter safety to staff in the Emergency Department, ICU, and other areas. The class provided training for safely loading and unloading patients, as well as preparing patients for transport.

## Baltimore Regional Burn Center Johns Hopkins Bayview Medical Center

*The Baltimore Regional Burn Center manages more than 600 patients a year. Stephen Milner, MD, DDS, is the Director of the Burn Center.*

Since his arrival in May 2005, Dr. Milner has supported the burn service with daily patient rounds, weekly patient conferences, and several patient safety initiatives, such as reducing the incidence of central line associated bloodstream infection (BSI).

In early 2006, the name of the Baltimore Regional Burn Center was changed to the Johns Hopkins Burn Center to better reflect the scope and depth of Hopkins Medicine beyond the Baltimore metropolitan area.

The reporting year for the annual report has changed this year to be congruent with the reporting year presented by the trauma centers. Data for this report reflect patients seen at the Johns Hopkins Burn Center (JHBC) from June 1, 2005 through May 31, 2006. For this fiscal year, 638 patients were treated at JHBC.

### Patients Treated

<b>Admissions</b>	<b>373</b>
ICU level	180
IMC or Med-Surg level	179
Pediatric	14
<b>Non-admissions</b>	<b>265</b>
Discharged w/follow-up	207
Discharged against med'l advice	11
Deceased	1
Pediatric Short Stay	2
Transferred	38
Unknown, not reported	6
<b>Total</b>	<b>638</b>

Of these patients, 70% (449) were male, and 30% (189) were female. Ages range from 1 month to 94 years with a mean age of 35 years. Patients are admitted to the burn center for an average of 7 days (minimum 1 day; maximum 161 days).

Most patients are discharged home. Many require the assistance provided by home health care, a skilled nursing facility, or a rehabilitation center. Unfortunately some patients do not survive their burn injury despite the burn center's emphasis on early debridement and grafting of burn wounds. JHBC has one of the lowest death rates

of burn centers across the nation. Its death rate for admitted patients is 2.4% (9/373) and 1.6% (10/638) of all patients (admissions and those treated in the ED only). The final disposition distribution for admissions is presented below:

### **Final Disposition Distribution**

<b>Disposition</b>	<b>Count</b>
Death	9
Home	294
Home w/Services	36
Psychiatric	5
Rehabilitation Center	7
Skilled Nursing Facility	12
Transfer, Acute Care Facility	4
Transfer, Spec'l Referral/Trauma	1
Other	2
Not Available	3
<b>Total</b>	<b>373</b>

For patients needing management of their burn wounds in the outpatient setting, the Burn Clinic managed 1360 patient visits this past fiscal year.

### **Statistics for Inpatient and ED patients**

#### **Mode of arrival to JHBC**

<b>Mode</b>	<b>Count</b>
ALS	278
BLS	11
Comm. Ambulance	97
Comm. Helicopter	26
MSP	65
Not Available	3
Not Recorded	9
Private Vehicle	12
Walk	137
<b>Total</b>	<b>638</b>

#### **Burn Wound Types**

<b>Type</b>	<b>Count</b>
Chemical	41
Contact	41
Electrical	48
Flame	232
Inhalation, smoke/CO	29
Not Recorded	6
Other Burn	2
Radiation	4
Scald	221
Skin Disease	9
Unknown	2
Wound	3
<b>Total</b>	<b>638</b>

Overall, flame and scald burns account for 453 or 71% of patients seen in the ED or admitted to JHBC.

JHBC supports outside hospitals by consulting with physicians within the surrounding communities about burn patients seen in outlying hospitals. JHBC has received 211 patients in transfer from these hospitals.

### **The Burn Center at the Washington Hospital Center**

*The Burn Center at the Washington Hospital Center is located in the District of Columbia and serves as the adult regional burn center for the District, southern Maryland, and northern Virginia. Marion Jordan, MD, is the Director.*

The Burn Center features a 7-bed intensive care unit with a dedicated operating room and recovery room, a 10-bed intermediate/rehabilitation care unit, and the Skin Bank for Burn Injuries.

Reconstructive surgery and rehabilitation are available for patients in the post-acute and convalescent phases, regardless of where they received treatment for their acute burns.

Patients with minor burns that do not require hospitalization are provided with outpatient wound care and rehabilitation through the Burn Center Clinic.

### **The Curtis National Hand Center At Union Memorial Hospital**

*The Curtis National Hand Center at Union Memorial Hospital serves as the state's referral center for specialized care of injuries to the hand, wrist, and elbow, including significant elbow trauma and injuries requiring microsurgical reconstruction. Thomas J. Graham, MD, is the Director.*

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. Thomas J. Graham, MD, is the Director of the Curtis National Hand Center and the Chief of the Union Memorial Hospital Division of Hand Surgery, as well as the Vice-Chairman of Orthopaedics at Union Memorial, and is an Associate Professor of both Orthopaedic and Plastic Surgery at Johns

Hopkins University. Dr. Graham leads the largest group of Hand Surgeons in the nation with one of the world's greatest depth of experience and expertise in the care of the traumatically-injured hand, wrist, forearm, and elbow (see [www.nationalhandspecialists.com](http://www.nationalhandspecialists.com).)

The Curtis National Hand Center remains committed to handling acute injuries and providing reconstructive surgery for Maryland's trauma victims in need of their special capabilities. The focus on complex hand, wrist, and elbow injuries has long been part of the well-developed Maryland trauma care system, since the Center's founder, Dr. Raymond M. Curtis, collaborated with Dr. R Adams Cowley and others during the inception of Shock Trauma and the Maryland EMS System. Over the past year, the Hand Center was an active participant in the administrative and legislative affairs of TraumaNet and has made substantial progress to receive a formal designation as a recognized specialty trauma center.

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 Hand Surgery Service at Union Memorial Hospital (see [www.unionmemorial.org](http://www.unionmemorial.org).)

The Curtis National Hand Center is one of the largest training centers for Hand Surgery. The Center's relationships with Johns Hopkins Hospital, Georgetown University, Walter Reed Army Medical Center, and Union Memorial Hospital continue to provide extraordinary training because of the volume and variety of the pathology. 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 continue to lecture worldwide about the topic of hand trauma.

Continuing 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, soft tissue problems, and reconstruction after significant trauma. Collaborations with the region's scientists and other investigators promote current thinking and new development in this vital area.

Among other upcoming projects is the physical reorganization of the trauma intake facility to introduce even better processes for the injured patient. The value of the association of The Curtis National Hand Center and MIEMSS is clear and

strong. The cooperative effort underway to better define the Hand Center's role as one of the unique "Specialty Trauma Centers" will allow the entire system to function more effectively and better ensure top quality care for Maryland's injured. Forthcoming will be enhanced transfer criteria and instructions, and improved data collection compatible with TraumaNet's excellent recording system.

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. One of the country's most important resources in the care of hand and upper extremity trauma is proud to be one of the critical components in Maryland's strong network for care of her injured citizens.

### **Hyperbaric Medicine Center R Adams Cowley Shock Trauma Center**

*The Hyperbaric Medicine Center of the R Adams Cowley Shock Trauma Center of the University of Maryland Medical System is the statewide referral center for victims of diving accidents, carbon monoxide poisoning, smoke inhalation, and gas gangrene. It is the only multi-place chamber in Maryland, and is capable of accommodating 10 stretcher patients or 23 seated patients simultaneously. The center is able to provide treatment around the clock, 365 days a year. Robert Rosenthal, MD, is the Director of the Hyperbaric Medicine Center.*

During FY 2006, hyperbaric medicine treatments were given to 378 patients. Among the types of cases treated were carbon monoxide poisoning/smoke inhalation; acute gas embolism; decompression sickness (the bends); necrotizing acute soft tissue infections; osteoradionecrosis; gangrene; late effects of radiation; compromised skin grafts and flaps; and crush injuries.

All treatments are supervised by specially trained hyperbaric physicians; direct patient contact is administered by critical care nurse "tenders" who provide patient care in the chamber during all "dives." Because of the chamber's unique design and staffing, even the most critically ill patients can receive hyperbaric treatments without any interruption of care.

Physician and nursing members of the Hyperbaric Medicine Center actively lecture on hyperbaric medical education at regional and national levels and to local and regional EMS providers.

## Maryland Eye Trauma System The Wilmer Eye Institute at Johns Hopkins

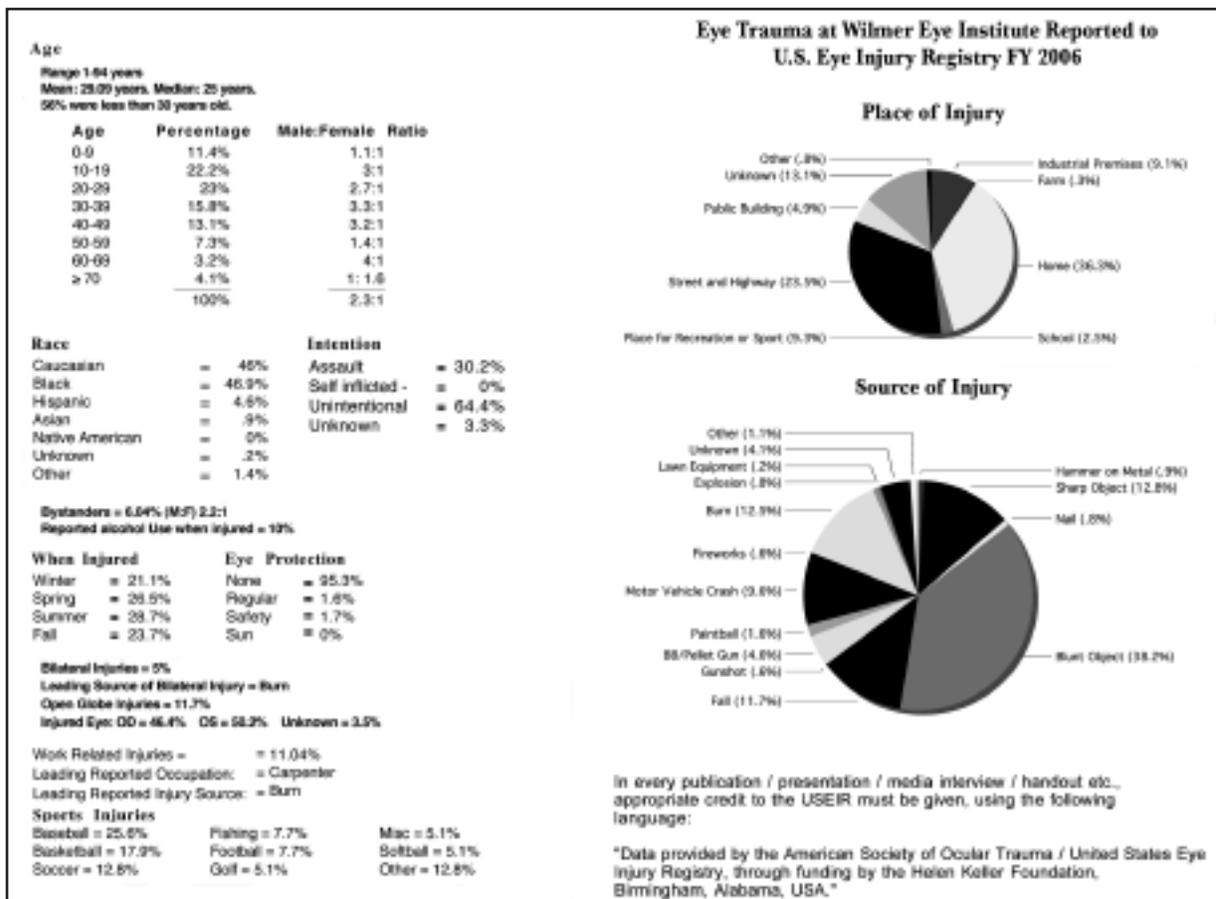
*The Eye Trauma Center at the Wilmer Eye Institute (WEI), Johns Hopkins Hospital is the first statewide eye trauma center in the nation. The main objectives of the eye trauma center are to provide optimal clinical management of severe ocular injuries, to conduct research into the natural history of eye 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 Associate Director for FY 2007 is Daniel C. Garibaldi, MD; Victoria B. Navarro, RN, MSN, MAS, is interim Eye Trauma Coordinator.*

For FY 2006, the Wilmer Emergency Department logged 4,927 patient visits and reported 634 serious eye injuries to the U.S. Eye Injury Registry (see box below). Injuries occurred mostly in homes (36.3 %). Baseball continues to be highest for sport injuries. Blunt injury continues to be the highest source, followed by sharp objects, burns, and falls.

In October 2005, Wilmer submitted its application for re-verification as the state-designated Specialty Referral Center for Ocular Trauma. Dr. Ferenc Kuhn, MD, PhD, Executive Vice President, International Society of Ocular Trauma and President, American Society of Ocular Trauma, and Mary Beachley, MSN, RN, Director of Healthcare Facilities & Special Programs at MIEMSS, performed the application review and validation site visit in November 2005. Wilmer met and exceeded the standards for designation for an eye trauma center. It was suggested that Wilmer publish "a standard for care and treatment and outline the infrastructure necessary to establish, organize, and effectively operate an Eye Trauma Center." This led to a presentation by Dr. Michael Grant on "Blueprint for Organizing a Level I Eye Trauma Center—The Wilmer Eye Institute Experience," at the Seventh International Symposium on Ocular Trauma, Rome, Italy.

Wilmer faculty presented courses in national and international ophthalmology symposia and meetings. These included:

Dr. Nicholas Iliff, Division Director of Oculoplastic and Orbital Surgery, and faculty (Drs. Shannath Merbs, D. Garibaldi, and Gregory



Schmidt) presented 9 courses during the AO ASIF Advanced Course in Maxillofacial Surgery. (Interlaken Switzerland, ASOPRS 36th Annual Fall Scientific Symposium, Chicago, IL.)

Dr. Neil R. Miller, Division Director of Neuro Ophthalmology, presented during the European American Ophthalmology Symposium, French-American Symposium on Ophthalmology and Otolaryngology, and AO North America Course. Dr. Miller also published an article: RL, Geist CE, Miller NR. Isolated oculomotor palsy following minor head trauma. *Neurology* 65:169-170, 2005.

War-related eye injuries have come to the forefront. Dr. Michael Grant gave five presentations on orbital fracture during the Third International Craniomaxillofacial Conference, sponsored by the GATA Military Hospital, Ankara, Turkey.

The 23rd Wilmer Nursing Conference had 2 eye trauma topics: "Predictors of Open Globe Injury Outcome" (Dr. G. Schmidt) and "Ophthalmic War Surgery: Between Iraq and a Hard Place" (Dr. H. Fechter III).

### **Neurotrauma Center R Adams Cowley Shock Trauma Center**

*The Neurotrauma Center at the R Adams Cowley Shock Trauma Center of the University of Maryland Medical System, provides comprehensive management for patients with brain, spinal cord, and spinal-column-related injuries. Bizhan Aarabi, MD, is the Director of the Neurotrauma Center.*

During FY 2006, there were 257 cases of cervical spine injuries and craniotomies. These included craniotomies for hematoma evacuation, gunshot wounds to the head, debridement, elevation of depressed skull fractures, decompressive craniectomies, and cranioplasties. Spine cases included discectomies, laminectomies, arthrodesis, and open reduction internal fixations.

### **Pediatric Trauma Center at the Johns Hopkins Children's Center**

*In FY 2006, 995 children (ages newborn to 15 years) were treated at the Pediatric Trauma Center at the Johns Hopkins Children's Center, located in Baltimore City. Paul Colombani, MD, is the Director, and Susan Ziegfeld, MSN, CCRN, CRNP-pediatric, serves as the Trauma and Burn Program Manager.*

Located in the Johns Hopkins Hospital (listed as one of the "Best of the Best" hospitals in the *U.S. News & World Report* rankings for the past 16

years), the Pediatric Trauma Service (PTS) at the Johns Hopkins Hospital Children's Center is the Level I pediatric trauma facility in the state of Maryland. The PTS is an advocate in the care of critically ill and injured children and is actively involved in the prevention of pediatric injuries at the local, state, and national levels. The PTS integrates patient care with ongoing basic science research. The PTS conducts ongoing clinical research and collaborates with other departments and the community to provide childhood injury prevention activities. Paul M. Colombani, MD, FACS, FAAP, is the Children's Surgeon-in-Charge at Johns Hopkins and the Director of the PTS. He serves on TraumaNet and on the Pediatric Emergency Medical Advisory Committee.

Susan Ziegfeld, MSN, CRNP, Trauma and Burn Program Manager, serves on TraumaNet, the Maryland Trauma and Specialty Care Quality Improvement Committee, and on the Maryland Trauma Registry, Education and Injury Prevention Committee. She is a Course Director for the Advanced Trauma Care for Nurses, in collaboration with the Air Force and R Adams Cowley Shock Trauma Center, training nurses in Advanced Trauma Life Support.

Rosemary Nabaweesi, MPH, the Pediatric Trauma Coordinator, is responsible for data abstraction, report writing, and conducting research from the trauma registry. She serves on the Maryland Trauma Registry, Education and Injury Prevention Committee, Maryland Trauma and Specialty Care Quality Improvement Committee, Injury Free Coalition for Kids of Baltimore and Trauma Net. She is currently conducting a retrospective study on pediatric pelvic fractures.

Mary Pasquariello, CSTR, Pediatric Trauma Data Coordinator, oversees all aspects of data collection and management. Ms. Pasquariello is certified as a car safety seat technician and certified by the American Trauma Society as Specialist in Trauma Registry.

Stacey Nash, RN, BSN, serves as Performance Improvement Coordinator. Responsible for coordinating monthly pediatric trauma morbidity and mortality conferences, she also initiates trauma-related performance improvement projects in the Johns Hopkins Children's Center. In addition, she serves as a liaison between the EMS community and the PTS. Ms. Nash coordinates the yearly multi-departmental EMS Appreciation Week, which distributes thank-you gift cards to 50 pre-hospital providers.

The newest member of the JHH PTS is Amy Wookcheke, PA-C. Amy joined the team in September 2005 and will assist in providing care to pediatric trauma and burn patients.

Rosemary Stinebert is the Program Coordinator for Hopkins Outreach for Pediatric Education (HOPE). The HOPE program has continued to provide quality educational programs for all prehospital providers and has expanded to offering approximately 25 classes annually. Approximately 500 participants have completed the Pediatric Advanced Life Support (PALS) course during the past year.

Mahseeyahu Ben Selassie, MSW, MPH, serves as Project Administrator for the Robert Wood Johnson Foundation-sponsored Injury Free Coalition for Kids (IFCK). IFCK is a national network of community-based hospitals and community advocates, focused on the prevention and reduction of injuries to children. The Baltimore Coalition's program utilized hospital data and input from community residents on injuries to children in their homes and neighborhoods. The fourth Parent Safety Leadership Group is now underway, training parents and caregivers in various areas of injury prevention, such as fire and burn prevention. The IFCK utilized funding from the Children's Miracle Network Telethon to expand home fire prevention and education outreach programs through distribution of numerous informational materials to hospitals and community groups.

Inspired by cases of children who suffered burn injuries or death in homes where the gas and electric had been terminated due to non-payment of utility bills, the Johns Hopkins Home Energy Working Group, of which the IFCK is a member, challenged the Maryland State Public Service Commission and the utilities to revise shut-off policies. A settlement was reached in September 2005, in lieu of a regulatory change. A key goal of the settlement is to improve coordination between the utilities and the Maryland Office of Home Energy Programs (OHEP) to minimize the possibility of service termination to customers who have applied for the Electric Universal Service Program benefits (EUSP).

### **Pediatric Trauma Center Children's National Medical Center**

*In FY 2006, Children's National Medical Center, as a pediatric specialty referral center, treated 920 children with multiple trauma and burns who were residents of Maryland or who were injured in*

*Maryland. Martin R. Eichelberger, MD, is the Director of Emergency Trauma-Burn Services, and Geraldine Pratsch, RN, MPH, is the Program Manager; Sarah Storing, RN, BSN, is the Trauma Coordinator; and Lisa Ring, MSN, CPNP, is the Burn Nurse Practitioner.*

The Children's National Medical Center (CNMC) was re-verified by the American College of Surgeons in July 2004 as a Level I Pediatric Trauma Center. CNMC serves the pediatric community of Maryland EMS Region V, which includes Montgomery, Prince George's, Calvert, Charles, and St. Mary's counties, by caring for children with multiple trauma and burns.

CNMC provides pediatric emergency and trauma education to physicians, nurses, and pre-hospital providers. The EMT-B course is offered twice a year. Thirteen courses in Pediatric Advanced Life Support (PALS) are offered annually. The Center for Prehospital Pediatrics has produced a regional report on the state of EMSC in the Mid-Atlantic Region. The Trauma Nurse Core Curriculum (TNCC) is offered annually. Advances in Pediatric Emergency Medicine is also offered annually to community physicians. Numerous pediatric trauma outreach educational programs are offered to all levels of providers throughout the Maryland EMS System.

Since its inception in 1987, Safe Kids Worldwide (formerly the National SAFE KIDS Campaign), a subsidiary of CNMC, has contributed to a 45 percent decrease in child fatalities from unintentional injuries overall and a decrease of 70 percent from bicycle injuries, 67 percent from fire and burns, 52 percent from drowning, and 16 percent from motor vehicle crashes. Working through more than 450 state and local Safe Kids coalitions in the United States and 15 other countries, Safe Kids delivers proven programs at the grassroots level to prevent unintentional injury to children ages 14 and under. In addition, Safe Kids provides critical safety devices to households that cannot afford them; advocates for new and stronger safety laws; and conducts primary research to identify the most vulnerable child populations and risk factors for unintentional injury ([www.safekids.org](http://www.safekids.org)).

CNMC houses the Emergency Medical Services for Children (EMSC) National Resource Center that supports states and health professionals to implement programs to enhance the quality of medical and trauma care provided to children and youth. The EMSC state partnership grants are

now focused on accomplishing specific performance measures that will improve the operational capacity of the state to provide pediatric emergency care. These performance measures address medical direction, equipment on ambulances, hospital facility recognition programs for pediatric emergency and trauma care, inter-facility transport agreements, and educational requirements for the recertification of paramedics. Resources for grantees are provided related to strategic planning and program development, coalition building, and project management. The EMSC National Resource Center supports the Federal EMSC program with many activities, such as the preparation of special reports, as well as planning and implementing the annual grantee meeting, the Partnership for Children stakeholder committee, and numerous web casts. The EMSC National Resource Center maintains the EMSC program web site at <http://www.mchb.hrsa.gov/emsc>.

CNMC is one of 40 pediatric centers participating in the Partnership for Development and Dissemination of Outcome Measures for Injured Children: A Multi-Center Study of Burn Injury Assessment and Outcomes, coordinated by the American Pediatric Surgical Association (APSA). The objective is to obtain patient-based clinical data that allow for a comparison among burn treatments used in current practice. The data include clinical assessment and management, patient parameters of pain and anxiety, appearance, behavior, and parental issues such as expectations and stress. The data will be analyzed to determine which clinical management strategies appear to optimize outcome ([www.eapsa.org](http://www.eapsa.org)).

### **Perinatal Referral Centers**

MIEMSS has worked closely with the Department of Health and Mental Hygiene (DHMH) regarding perinatal centers in Maryland. DHMH provides grant funds to support a full-time staff member to coordinate the perinatal programs at MIEMSS. (See page 35 for a complete list of perinatal centers.)

### **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 general public and health professionals in the state who call the nationwide number 800-222-1222. A division of the University of Maryland School of Pharmacy, MPC is designated by the Maryland Department of Health and Mental Hygiene as a regional poison center for Maryland. MPC also serves*

*as a consultation center for MIEMSS. Bruce D. Anderson, PharmD, DABAT, is Director of Operations, and Suzanne Doyon, MD, ACMT, is Medical Director.*

In Calendar Year 2005, the Maryland Poison Center (MPC) received 68,334 calls. While 35,487 of these calls involved a human exposure, 2,079 involved animal exposures, and the remaining 30,768 were requests for information where no exposure occurred. The majority of poison exposures (51%) involved children under the age of six. Although the incidence of poisoning is greater in children, most severe poisonings and poisoning deaths occur in adolescents and adults. Seventy-four percent of the cases reported to the MPC were managed at a non-health care facility site, such as the home, school, or workplace. Safely managing these patients at the site of the exposure saves millions of dollars in unnecessary health care costs. It also allows more efficient and effective use of limited health care resources.

All of the poison specialists who work in 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 Maryland Poison Center works closely with state and national agencies to monitor for possible chemical and biological weapons exposures. The MPC and the National Capital Poison Center in Washington, DC developed a joint toxic surveillance program to enable the early detection and containment of potential public health and terrorist events throughout the Maryland and Washington, DC region. This project was implemented in September 2004 and is funded by the Maryland Department of Health and Mental Hygiene. 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 index cases, evolving patterns, or emerging clusters of exposures. This toxic surveillance program has two components:

- Clinical effects outliers are determined by comparing the daily frequency of each of 131 clinical effects with historical means.
- The system monitors for cases meeting specific surveillance case definitions for cyanide, botulism, nerve agents, blister agents, and cutaneous anthrax.

The Maryland Poison Center's public education efforts are intended to help increase people's 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 they can quickly and easily get information by contacting the Maryland Poison Center, 24/7, if a poisoning occurs. In 2005, the MPC provided speakers and/or materials for 109 programs in 18 Maryland counties and Baltimore City. Angel Bivens, BSPHarm, MBA, CSPI, led classes that were attended by over 9,300 people. Several organizations partnered with the MPC to provide education to their patients, customers, clients, and students. These organizations included fire departments, hospitals, health departments, schools, police departments, childcare agencies, pharmacies, and the Red Cross, as well as Head Start and Healthy Start programs. In all, over 41,000 pieces of educational materials (brochures, magnets, telephone stickers, Mr. Yuk stickers, teacher's kits, and other pieces) were distributed at these programs and by these organizations. Over 122,000 pieces of additional materials were mailed to people and groups who requested them.

In CY 2005, there were two noteworthy public education events. Poison Prevention Week 2005 (March 20-26) was observed by presenting a poison prevention education program for the kindergarten class at Thomas Johnson Elementary School in Baltimore City. Kendel Ehrlich, Maryland's First Lady, presented the program along with Angel Bivens, public education coordinator for the Maryland Poison Center. The children sat in awe as Mrs. Ehrlich and Mrs. Bivens described how to

stay safe from poisons. The children were provided with educational materials to take home to their families.

On November 8, 2005, the Maryland Poison Center and the National Capital Poison Center (NCPC) held a joint Train the Trainer program in Prince George's County for MIEMSS Region V. The program was made possible by grant funding from EMSC. Angel Bivens and Rose Ann Soloway, public educator from NCPC, trained 18 people from Prince George's, Montgomery, Charles, St. Mary's, and Calvert counties. The attendees were provided with a comprehensive training manual that will enable them to go into their communities to teach poison prevention lessons and programs for children, adults, and seniors.

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 that end up in a health care facility. The professional education program is coordinated by Lisa Booze, PharmD, CSPI. In 2005, 59 programs were conducted at hospitals, fire departments, and state and regional conferences. These programs were attended by over 2,000 EMS providers, physicians, nurses, pharmacists, and physician assistants. The MPC also provides professional education through publications. "Toxtidbits" is faxed monthly to every Maryland emergency department and emailed to over 2,500 health professionals. "Toxalert" reaches over 4,000 health care providers by email and mail. Current and past issues of "Toxalert" and "Toxtidbits" can be found on the MPC's website at [www.mdpoison.com](http://www.mdpoison.com).

The Maryland Poison Center provides on-site training for health professionals. In 2005, more than 100 EMS providers, paramedic students, physicians, and pharmacists visited the MPC to learn more about the assessment and treatment of poisoned patients.



### **Reason for Poisoning (CY 2005)**

Circumstance	Number of Patients	Percentage
Unintentional	28,770	81.1
Intentional	5,488	15.5
Other & Unknown	1,229	3.4
<b>TOTAL</b>	<b>35,487</b>	<b>100.0</b>

## Medical Outcome of Poisoning (CY 2005)

Medical Outcome	Number of Patients	Percentage
No Effect/Minor Effect	32,413	91.3
Moderate Effect	1,559	4.4
Major Effect	152	0.4
Death	28	0.1
Other & Unknown	1,335	3.8
<b>TOTAL</b>	<b>35,487</b>	<b>100.0</b>

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 2005)

Region	Number of Exposures	Percentage
Region I (Garrett, Allegany)	804	2.3
Region II (Washington, Frederick)	2,927	8.2
Region III (Carroll, Howard, Harford, Anne Arundel, Baltimore County, Baltimore City)	21,886	61.7
Region IV (Cecil, Kent, Queen Anne's, Talbot, Caroline, Dorchester, Wicomico, Worcester, Somerset)	3,745	10.5
Region V (Montgomery, Prince George's Charles, Calvert, St. Mary's)	4,644	13.1
Unknown County/ Other state	1,481	4.2
<b>TOTAL</b>	<b>35,487</b>	<b>100.0</b>

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 11,073 human exposures in Maryland were reported to the National Capital Poison Center in 2005.

## 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.

Maryland has a statewide coverage of rehabilitation providers to treat patients who have experienced neurotrauma, multi-trauma, and orthopedic injuries in various treatment settings. The trauma centers provide transitional (subacute) care or have transfer agreements with rehabilitation hospitals 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 2006, trauma centers in Maryland referred 1,532 trauma patients ages 15 and over to inpatient rehabilitation services. There was an increase of 40 patients referred for rehabilitation from FY 2005. The ten rehabilitation facilities receiving the most patients are listed on this page.

### TOP TEN DESTINATIONS OF PATIENTS 15 & OVER WHO WENT TO INPATIENT REHABILITATION FACILITIES: (JUNE 2005 TO MAY 2006)

Source: Maryland Adult Trauma Registry

Rehabilitation Center	Number
Adventist Health Care	29
Genesis Long-Term Care Facilities	30
Good Samaritan Hospital of Maryland	28
Kernan Hospital	427
Maryland General Hospital	70
NRH Regional Rehabilitation @ Irving Street, DC	20
Peninsula Regional Medical Center, Transitional Care Unit	15
Sinai Rehabilitation Center	34
Washington County Health System, Comprehensive Inpatient Rehabilitation Services	59
Western Maryland Health System, Comprehensive Rehabilitation Unit	15

Note: Total patients ages 15 and over who went to a rehabilitation center = 1,532

# MARYLAND TRAUMA STATISTICS

## AGE DISTRIBUTION OF PATIENTS: PATIENTS TREATED AT PEDIATRIC OR ADULT TRAUMA CENTERS (3-YEAR COMPARISON)

Source: Maryland Trauma Registry

Age Range	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
Under 1 year	162	163	201
1 to 4 years	618	615	603
5 to 9 years	639	617	622
10 to 14 years	887	865	923
15 to 24 years	4,963	5,138	5,508
25 to 44 years	6,475	6,448	6,739
45 to 64 years	3,545	3,668	4,022
65 + years	1,662	1,789	1,817
Unknown	22	19	25
<b>TOTAL</b>	<b>18,973</b>	<b>19,322</b>	<b>20,460</b>

## ADULT TRAUMA

### LEGEND CODE

The Johns Hopkins Bayview Medical Center	BVMC
Johns Hopkins Medical System	JHH
Peninsula Regional Medical Center	PEN
Prince George's Hospital Center	PGH
R Adams Cowley Shock Trauma Center	STC
Sinai Hospital of Baltimore	SH
Suburban Hospital	SUB
Washington County Hospital Association	WCH
Western Maryland Health System- Memorial Campus	WMHS

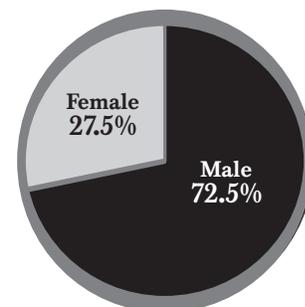
## TOTAL CASES REPORTED BY TRAUMA CENTERS (3-YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

Trauma Center	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
The Johns Hopkins Bayview Medical Center	1,250	1,294	1,497
Johns Hopkins Medical System	2,308	2,025	1,899
Peninsula Regional Medical Center	780	844	1,168
Prince George's Hospital Center	2,647	2,744	3,075
R Adams Cowley Shock Trauma Center	5,833	6,138	6,119
Sinai Hospital of Baltimore	1,513	1,596	1,748
Suburban Hospital	1,313	1,255	1,433
Washington County Hospital Association	847	947	938
Western Maryland Health System- Memorial Campus	603	652	668
<b>TOTAL</b>	<b>17,094</b>	<b>17,495</b>	<b>18,545</b>

## GENDER OF PATIENTS: PRIMARY ADMISSIONS ONLY (June 2005 to May 2006)

Source: Maryland Adult 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.

**OCCURRENCE OF INJURY BY COUNTY:  
SCENE ORIGIN CASES ONLY  
(JUNE 2005 TO MAY 2006)**

Source: Maryland Adult Trauma Registry

County of Injury	Number
Allegany County	312
Anne Arundel County	949
Baltimore County	1,978
Calvert County	132
Caroline County	68
Carroll County	329
Cecil County	170
Charles County	250
Dorchester County	126
Frederick County	410
Garrett County	69
Harford County	417
Howard County	382
Kent County	71
Montgomery County	1,268
Prince George's County	1,426
Queen Anne's County	146
St. Mary's County	147
Somerset County	84
Talbot County	61
Washington County	534
Wicomico County	360
Worcester County	175
Baltimore City	4,380
Virginia	58
West Virginia	236
Pennsylvania	116
Washington, DC	98
Delaware	126
Not Indicated	1912
<b>TOTAL</b>	<b>16,790</b>

Note: Scene origin cases represent 90.5% of the total trauma cases treated statewide.

**RESIDENCE OF PATIENTS BY COUNTY:  
SCENE ORIGIN CASES ONLY  
(JUNE 2005 TO MAY 2006)**

Source: Maryland Adult Trauma Registry

County of Residence	Number
Allegany County	281
Anne Arundel County	861
Baltimore County	2,286
Calvert County	175
Caroline County	74
Carroll County	375
Cecil County	137
Charles County	299
Dorchester County	107
Frederick County	368
Garrett County	38
Harford County	482
Howard County	279
Kent County	55
Montgomery County	1,225
Prince George's County	1,963
Queen Anne's County	93
St. Mary's County	119
Somerset County	110
Talbot County	46
Washington County	430
Wicomico County	363
Worcester County	132
Baltimore City	4,386
Virginia	370
West Virginia	273
Pennsylvania	393
Washington, DC	359
Delaware	233
Other	366
Not Indicated	112
<b>TOTAL</b>	<b>16,790</b>

Note: Scene origin cases represent 90.5% of the total trauma cases treated statewide.

**PATIENTS WITH PROTECTIVE DEVICES AT  
TIME OF TRAUMA INCIDENT:  
PRIMARY ADMISSIONS ONLY  
(3-YEAR COMPARISON)**

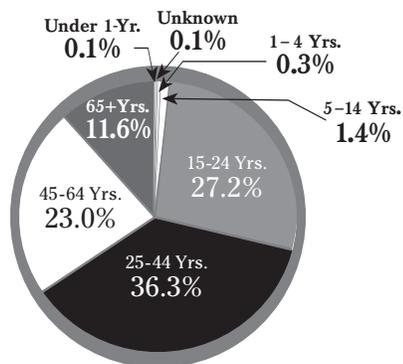
Source: Maryland Adult Trauma Registry

Protective Device	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
None	27.4%	25.7%	22.5%
Seatbelt	36.4%	35.7%	31.5%
Airbag & Seatbelt	15.3%	15.7%	14.9%
Airbag Only	3.3%	3.9%	3.2%
Infant/Child Seat	0.1%	0.2%	0.2%
Protective Helmet	8.9%	10.2%	12.7%
Padding/Protective Clothing	0.1%	0.1%	0.1%
Other Protective Device	0.1%	0.1%	0.1%
Unknown	8.4%	8.4%	14.8%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Note: Patients were involved in motor vehicle, motorcycle, bicycle, and sports-related incidents only. "Primary Admissions" refers to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

**AGE DISTRIBUTION OF PATIENTS: PRIMARY ADMISSIONS ONLY (June 2005 to May 2006)**

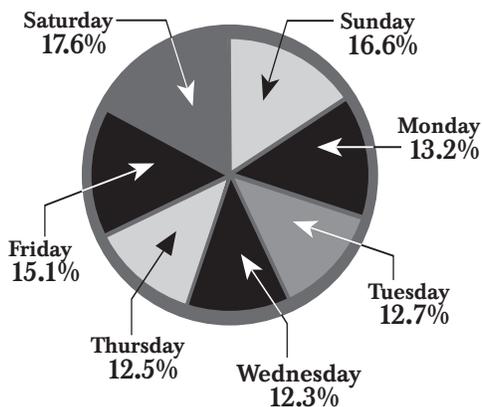
Source: Maryland Adult Trauma Registry



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 table. For patients treated at pediatric trauma centers, see pediatric trauma center tables and graphs.

**EMERGENCY DEPARTMENT ARRIVALS BY DAY OF WEEK: PRIMARY ADMISSIONS ONLY (June 2005 to May 2006)**

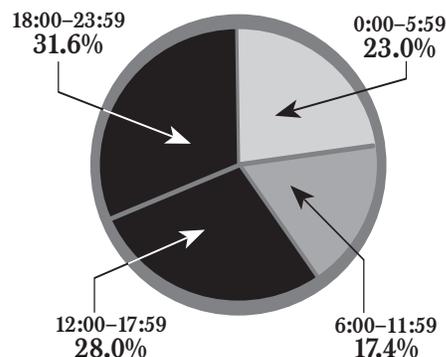
Source: Maryland Adult Trauma Registry



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

**EMERGENCY DEPARTMENT ARRIVALS BY TIME OF DAY: PRIMARY ADMISSIONS ONLY (June 2005 to May 2006)**

Source: Maryland Adult 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.

**MODE OF PATIENT TRANSPORT TO TRAUMA CENTERS (JUNE 2005 TO MAY 2006)**

Source: Maryland Adult Trauma Registry

Modality Type	BVMC	JHH	PEN	PGH	SH	STC	SUB	WCH	WMHS	TOTAL
Ground Ambulance	92.9%	91.5%	63.8%	57.9%	84.9%	67.1%	76.4%	67.3%	70.6%	72.9%
Helicopter	0.4%	1.6%	24.7%	36.3%	0.0%	31.4%	17.0%	19.4%	20.0%	20.8%
Other	6.7%	6.9%	11.5%	5.8%	15.1%	1.5%	6.6%	13.3%	9.4%	6.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

**ORIGIN OF PATIENT TRANSPORT TO TRAUMA CENTERS (JUNE 2005 TO MAY 2006)**

Source: Maryland Adult Trauma Registry

Origin Type	BVMC	JHH	PEN	PGH	SH	STC	SUB	WCH	WMHS	TOTAL
Scene of Injury	97.2%	94.8%	97.0%	97.5%	86.9%	83.4%	92.9%	92.6%	94.8%	90.8%
Hospital Transfer	0.1%	4.7%	2.7%	1.7%	1.9%	16.6%	3.8%	4.2%	2.3%	7.2%
Other	2.7%	0.5%	0.3%	0.8%	11.2%	0.0%	3.3%	3.2%	2.9%	2.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

### NUMBER OF DEATHS BY AGE (3-YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

Age	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
Under 1 year	1	0	0
1 to 4 years	1	4	1
5 to 14 years	14	7	10
15 to 24 years	164	192	186
25 to 44 years	188	214	229
45 to 64 years	116	131	133
65+ years	165	176	167
Unknown	6	8	7
<b>TOTAL</b>	<b>655</b>	<b>732</b>	<b>733</b>
Deaths Overall as a Percentage of the Total Injuries Treated	3.8%	4.2%	4.0%

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 Adult Trauma Registry

Age	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
Under 1 year	23	18	20
1 to 4 years	74	91	84
5 to 14 years	390	395	392
15 to 24 years	4,903	5,072	5,446
25 to 44 years	6,475	6,444	6,739
45 to 64 years	3,545	3,668	4,022
65+ years	1,662	1,789	1,817
Unknown	22	18	25
<b>TOTAL</b>	<b>17,094</b>	<b>17,495</b>	<b>18,545</b>

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 2005 TO MAY 2006)

Source: Maryland Adult Trauma Registry

Age	Number of Injured Patients		Number of Deaths	
	Total	Maryland Residents	Total	Maryland Residents
Under 1 year	20	15	0	0
1 to 4 years	84	66	1	1
5 to 14 years	392	317	10	8
15 to 24 years	5,446	4,844	186	167
25 to 44 years	6,739	5,871	229	198
45 to 64 years	4,022	3,503	133	109
65+ years	1,817	1,582	167	141
Unknown	25	23	7	7
<b>TOTAL</b>	<b>18,545</b>	<b>16,221</b>	<b>733</b>	<b>631</b>

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 TO PATIENTS: PRIMARY ADMISSIONS ONLY (3-YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

Etiology	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
Motor Vehicle Crash	40.5%	39.1%	36.4%
Motorcycle Crash	4.9%	5.3%	6.4%
Pedestrian Incident	5.7%	5.6%	5.3%
Fall	18.9%	19.9%	20.3%
Gunshot Wound	7.8%	8.5%	8.0%
Stab Wound	7.5%	7.0%	8.1%
Other	14.7%	14.6%	15.5%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

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 CONTENT OF PATIENTS BY INJURY TYPE: PRIMARY ADMISSIONS ONLY (JUNE 2005 TO MAY 2006)

Source: Maryland Adult Trauma Registry

Blood Alcohol Content	Motor Vehicle				Total
	Crash	Assault	Fall	Other	
Negative	57.6%	37.9%	47.6%	52.2%	50.6%
Positive	26.1%	33.7%	18.2%	14.3%	25.3%
Undetermined	16.3%	28.4%	34.2%	33.5%	24.1%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

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 AGES OF PATIENTS: PRIMARY ADMISSIONS ONLY (JUNE 2005 TO MAY 2006)

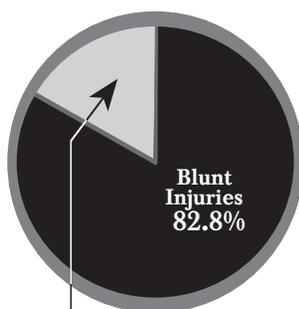
*Source: Maryland Adult Trauma Registry*

Age	Motor Vehicle Crash	Motorcycle	Pedestrian	Fall	Gunshot Wound	Stab Wound	Other	Total
Under 1 year	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%	0.1%
1 to 4 years	0.1%	0.0%	0.4%	0.7%	0.0%	0.0%	0.8%	0.3%
5 to 14 years	1.2%	0.6%	2.9%	1.6%	0.8%	0.8%	2.0%	1.4%
15 to 24 years	30.8%	24.2%	25.2%	10.7%	50.3%	39.1%	24.1%	27.2%
25 to 44 years	34.9%	49.2%	34.8%	25.6%	40.5%	45.9%	41.9%	36.4%
45 to 64 years	22.7%	24.6%	28.9%	28.9%	7.0%	13.1%	26.3%	22.9%
65+ years	10.1%	1.4%	7.8%	32.3%	1.0%	0.9%	4.5%	11.6%
Unknown	0.1%	0.0%	0.0%	0.1%	0.4%	0.2%	0.2%	0.1%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

*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.*

### INJURY TYPE DISTRIBUTION OF PATIENTS: PRIMARY ADMISSIONS ONLY (June 2005 to May 2006)

*Source: Maryland Adult Trauma Registry*



**Blunt Injuries**  
82.8%

**Penetrating Injuries**  
17.2%

*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 BLUNT INJURIES: PRIMARY ADMISSIONS ONLY (JUNE 2005 TO MAY 2006)

*Source: Maryland Adult Trauma Registry*

Etiology	Percentage
Motor Vehicle Crash	44.0%
Motorcycle Crash	7.7%
Pedestrian Incident	6.5%
Fall	24.2%
Other	16.7%
Unknown	0.9%
<b>TOTAL</b>	<b>100.0%</b>

*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 2005 TO MAY 2006)

*Source: Maryland Adult Trauma Registry*

Etiology	Percentage
Motorcycle Crash	0.1%
Gunshot Wound	46.4%
Stabbing	46.9%
Fall	1.3%
Other	4.3%
Unknown	1.0%
<b>TOTAL</b>	<b>100.0%</b>

*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 Adult Trauma Registry

Final Disposition	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
Inpatient Rehab Facility	10.7%	11.3%	11.4%
Skilled Nursing Facility	1.7%	1.7%	1.7%
Residential Facility	1.0%	1.0%	1.2%
Specialty Referral Center	3.9%	3.8%	3.2%
Home with Services	3.2%	2.9%	2.7%
Home	69.8%	69.1%	70.2%
Acute Care Hospital	2.0%	1.9%	1.8%
Against Medical Advice	2.0%	1.9%	1.9%
Morgue/Died	5.3%	5.7%	5.4%
Other	0.4%	0.7%	0.5%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

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 Adult Trauma Registry

ISS	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
1 to 12	74.3%	73.4%	73.4%
13 to 19	10.9%	10.7%	10.8%
20 to 35	10.4%	11.2%	11.9%
36 to 75	4.4%	4.7%	3.9%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

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 SCORE (ISS)  
BY INJURY TYPE: PRIMARY ADMISSIONS  
ONLY (JUNE 2005 TO MAY 2006)**

Source: Maryland Adult Trauma Registry

ISS	Blunt	Penetrating	Total
1 to 12	69.6%	73.4%	70.2%
13 to 19	16.5%	10.8%	15.5%
20 to 35	11.5%	11.9%	11.6%
36 to 75	2.4%	3.9%	2.7%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

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 Adult Trauma Registry

ISS	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
1 to 12	68.0%	67.9%	69.9%
13 to 19	17.2%	16.4%	16.5%
20 to 35	12.2%	12.9%	11.5%
36 to 75	2.6%	2.8%	2.4%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

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 Adult Trauma Registry

ISS	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
1 to 12	69.0%	68.9%	70.2%
13 to 19	16.1%	15.4%	15.5%
20 to 35	12.0%	12.6%	11.6%
36 to 75	2.9%	3.1%	2.7%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

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

# MARYLAND PEDIATRIC TRAUMA STATISTICS

## LEGEND CODE

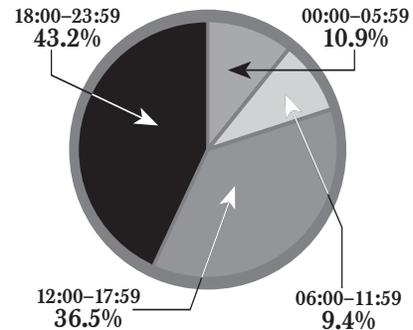
Children's National Medical Center CNMC  
 Johns Hopkins Pediatric Trauma Center JHP

## TOTAL CASES TREATED AT PEDIATRIC TRAUMA CENTERS (3-YEAR COMPARISON)

Trauma Center	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
CNMC	914	875	920
JHP	965	952	995
<b>TOTAL</b>	<b>1,879</b>	<b>1,827</b>	<b>1,915</b>

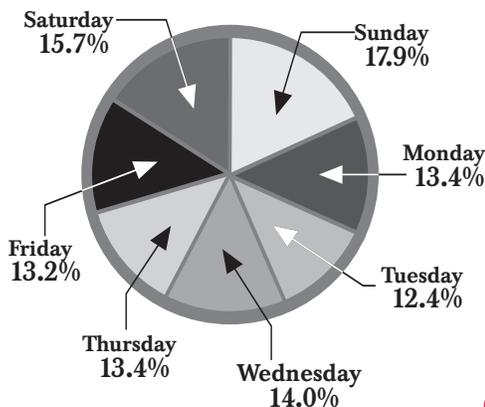
Note: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

## EMERGENCY DEPARTMENT ARRIVALS BY TIME OF DAY: CHILDREN TREATED AT PEDIATRIC TRAUMA CENTERS (June 2005 to May 2006)



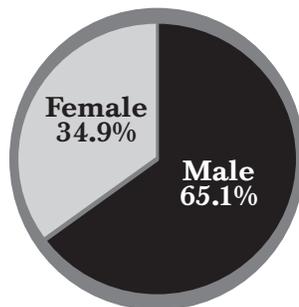
Note: For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

## EMERGENCY DEPARTMENT ARRIVALS BY DAY OF WEEK: CHILDREN TREATED AT PEDIATRIC TRAUMA CENTERS (June 2005 to May 2006)



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.

## GENDER PROFILE: CHILDREN TREATED AT PEDIATRIC TRAUMA CENTERS (June 2005 to May 2006)



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.

## OCCURRENCE OF INJURY BY COUNTY: SCENE ORIGIN CASES ONLY

Children Treated at Pediatric Trauma Centers (June 2005 to May 2006)

County of Injury	Number
Anne Arundel County	74
Baltimore County	106
Calvert County	27
Caroline County	7
Carroll County	40
Cecil County	25
Charles County	41
Dorchester County	3
Frederick County	24
Harford County	43
Howard County	25
Kent County	7
Montgomery County	115
Prince George's County	219
Queen Anne's County	21
St. Mary's County	29
Talbot County	7
Washington County	5
Worcester County	1
Baltimore City	158
Virginia	1
Washington, DC	19
Delaware	1
Not Indicated	171
<b>TOTAL</b>	<b>1,169</b>

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 61.0% of the total cases treated at pediatric trauma centers.

## MODE OF PATIENT TRANSPORT BY CENTER

*Children Treated at Pediatric Trauma Centers (June 2005 to May 2006)*

Modality Type	CNMC	JHP	Total
Ground Ambulance	32.3%	56.1%	43.7%
Helicopter	25.3%	35.9%	30.3%
Other	42.4%	8.0%	26.0%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

*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.*

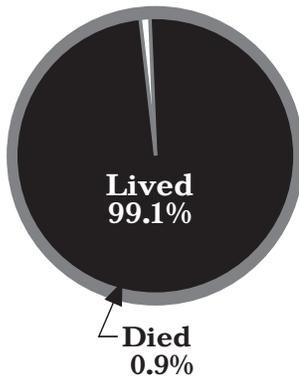
## ORIGIN OF PATIENT TRANSPORT BY CENTER:

*Children Treated at Pediatric Trauma Centers (June 2005 to May 2006)*

Origin	CNMC	JHP	Total
Scene of Injury	52.9%	68.7%	61.1%
Hospital Transfer	37.9%	27.6%	32.5%
Other	9.2%	3.7%	6.4%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

*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.*

## OUTCOME PROFILE: CHILDREN TREATED AT PEDIATRIC TRAUMA CENTERS (June 2005 to May 2006)



*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.*

## FINAL DISPOSITION OF PATIENTS

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

Final Disposition	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
Inpatient Rehab Facility	1.6%	1.9%	1.5%
Skilled Nursing Facility	0.0%	0.1%	0.0%
Residential Facility	1.1%	0.7%	0.4%
Specialty Referral Center	0.7%	0.6%	0.4%
Home with Services	2.4%	2.5%	1.5%
Home	91.3%	92.0%	93.7%
Acute Care Hospital	0.2%	0.3%	0.3%
Against Medical Advice	0.0%	0.0%	0.1%
Morgue/Died	1.7%	0.9%	0.9%
Foster Care	0.9%	0.4%	0.6%
Other	0.1%	0.6%	0.6%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

*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.*

## ETIOLOGY OF INJURIES BY AGES

*Children Treated at Pediatric Trauma Centers (June 2005 to May 2006)*

Age	Motor Vehicle Crash	Motorcycle	Pedestrian	Fall	Gunshot Wound	Stab Wound*	Other	Total
Under 1 year	5.0%	0.0%	1.1%	14.5%	0.0%	0.0%	11.4%	9.5%
1 to 4 years	18.1%	5.8%	18.0%	33.5%	8.0%	5.7%	32.4%	27.2%
5 to 9 years	34.7%	21.2%	37.5%	26.6%	16.0%	20.0%	17.4%	25.5%
10 to 14 years	40.5%	69.2%	41.8%	24.0%	64.0%	68.6%	33.0%	34.5%
15+ years	1.7%	3.8%	1.6%	1.4%	12.0%	5.7%	5.8%	3.3%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

*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.*

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

### INJURY TYPE

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

Injury Type	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
Blunt	80.5%	80.2%	80.5%
Penetrating	2.9%	3.2%	3.3%
Burn	7.1%	9.5%	9.4%
Near Drowning	1.7%	0.6%	0.6%
Hanging	0.1%	0.0%	0.3%
Inhalation	0.5%	0.8%	0.5%
Ingestion	5.8%	4.6%	4.3%
Crush	0.1%	0.1%	0.0%
Snake Bite/Spider Bite	0.1%	0.2%	0.2%
Animal Bite/Human Bite	0.8%	0.5%	0.7%
Other	0.4%	0.3%	0.2%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

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.

### MECHANISM OF INJURY

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

Mechanism	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
Motor Vehicle Crash	18.8%	22.0%	18.1%
Motorcycle Crash	2.1%	1.7%	2.8%
Pedestrian Incident	12.0%	10.6%	10.0%
Gunshot Wound	1.5%	1.4%	1.3%
Stabbing*	1.9%	1.7%	1.9%
Fall	29.7%	28.2%	31.1%
Other	34.0%	34.4%	34.8%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

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.

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

### NUMBER OF INJURIES BY AGE

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

Age	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
Under 1 year	139	145	181
1 to 4 years	544	524	519
5 to 9 years	501	467	496
10 to 14 years	635	620	657
15+ years	60	70	62
Unknown	0	1	0
<b>TOTAL</b>	<b>1,879</b>	<b>1,827</b>	<b>1,915</b>

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.

### NUMBER OF DEATHS BY AGE

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

Age	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
Under 1 year	3	1	3
1 to 4 years	13	6	3
5 to 9 years	10	3	4
10 to 14 years	6	6	6
15+ years	0	1	1
<b>TOTAL</b>	<b>32</b>	<b>17</b>	<b>17</b>

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.

### NUMBER OF INJURIES AND DEATHS BY AGE

#### Children Treated at Pediatric Trauma Centers (June 2005 to May 2006)

Age	Number of Injured Patients		Number of Deaths	
	Total	Maryland Residents	Total	Maryland Residents
Under 1 year	181	174	3	3
1 to 4 years	519	493	3	3
5 to 9 years	496	479	4	3
10 to 14 years	657	624	6	4
15+ years	62	60	1	1
<b>TOTAL</b>	<b>1,915</b>	<b>1,830</b>	<b>17</b>	<b>14</b>

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.

## RESIDENCE OF PATIENTS BY COUNTY: SCENE ORIGIN CASES ONLY

*Children Treated at Pediatric Trauma  
Centers (June 2005 to May 2006)*

County of Residence	Number
Anne Arundel County	95
Baltimore County	140
Calvert County	28
Caroline County	8
Carroll County	34
Cecil County	25
Charles County	44
Dorchester County	4
Frederick County	31
Garrett County	1
Harford County	48
Howard County	29
Kent County	8
Montgomery County	115
Prince George's County	233
Queen Anne's County	16
St. Mary's County	23
Talbot County	9
Washington County	6
Baltimore City	225
Virginia	5
Pennsylvania	14
Washington, DC	10
Delaware	3
Other	14
Not Indicated	1
<b>TOTAL</b>	<b>1,169</b>

*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 61.0% of the total cases treated at pediatric trauma centers.*

## CHILDREN WITH PROTECTIVE DEVICES AT TIME OF TRAUMA INCIDENT: CHILDREN TREATED AT PEDIATRIC TRAUMA CENTERS (3-YEAR COMPARISON)

Protective Device	June 2003 to May 2004	June 2004 to May 2005	June 2005 to May 2006
None	36.1%	31.9%	34.2%
Seatbelt	18.8%	23.2%	17.4%
Airbag & Seatbelt	2.4%	1.5%	1.2%
Airbag Only	0.4%	0.4%	0.4%
Infant/Child Seat	8.7%	9.6%	12.5%
Protective Helmet	8.3%	11.1%	10.4%
Padding/Protective Clothing	0.2%	0.2%	1.0%
Other Protective Device	0.4%	0.0%	0.0%
Unknown	24.7%	22.1%	22.9%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

*Note: Children were involved in motor vehicle, motorcycle, bicycle, and sports-related incidents only. For children who were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.*

## ETIOLOGY OF INJURIES BY AGES

*Children Treated at Pediatric Trauma Centers or Adult Trauma Centers (June 2005 to May 2006)*

Age	Motor Vehicle Crash	Motorcycle	Pedestrian	Fall	Gunshot Wound	Stab Wound*	Other	Total
Under 1 year	4.9%	0.0%	0.8%	13.3%	0.0%	0.0%	11.1%	8.6%
1 to 4 years	16.8%	4.8%	16.8%	33.5%	5.6%	4.7%	32.1%	25.8%
5 to 9 years	33.4%	19.4%	36.8%	26.6%	13.9%	18.6%	18.5%	26.1%
10 to 14 years	44.9%	75.8%	45.6%	26.6%	80.5%	76.7%	38.3%	39.5%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

*Notes: Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.*

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

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

*The National Study Center for Trauma and Emergency Medical Systems (NSC), at the University of Maryland School of Medicine, is the primary research center of the Maryland EMS System. The NSC collaborates with federal agencies, international organizations, academic institutions, private industry and governmental groups on projects focusing on injury epidemiology, injury prevention, and improvements in the prehospital and in-hospital delivery and coordination of trauma care. In addition, the NSC Board of Advisors, which includes a number of local, state, and national leaders in injury prevention, meets twice a year to review current programs and provide guidance to the NSC Director about current and future initiatives of mutual interest.*

The NSC continues to grow in terms of research and training activities. During the past year Colin F. Mackenzie, MD, stepped down as Director and Jon Mark Hirshon, MD, MPH, was named Acting Director. In addition, the NSC added several new full-time research staff to support recent project awards. During FY 2006, investigators at the National Study Center for Trauma and Emergency Medical Systems (NSC) had 15 articles published in peer-reviewed journals and another 6 manuscripts accepted for publication. The NSC newsletter, entitled *Injury Watch*, continues to be published on a quarterly basis. Finally, the faculty has received numerous grants, as delineated below.

## **Research Activities**

***Motor vehicle-related injuries:*** The NSC is a leading participant in two multi-center studies of injuries sustained in vehicular crashes, the Crash Injury Research and Engineering Network (CIREN) and the Crash Outcomes Data Evaluation System (CODES) Data Network. The NSC is one of seven centers awarded the CIREN project on an annually renewable basis through 2009. During FY 2006, CIREN data collection methods were improved to capture more specific biomechanical data on car crash victims. To enhance this effort, the NSC team welcomed the addition of biomechanical engineers from the The Johns Hopkins University Applied Physics Laboratory. As part of the CIREN project, the NSC was also requested by the National Highway Traffic Safety Administration (NHTSA) to present related findings at a quarterly CIREN meeting in

March in Washington, DC. Using data obtained from all CIREN centers located in the U.S., NSC staff identified risk factors for head, thoracic, and lower extremity injuries sustained by drivers and passengers in motor vehicles with modern restraint systems. More recently, a manuscript documenting risk factors associated with pelvic fractures occurring among 1,851 CIREN patients, including the association found between pelvic injury and near-side lateral crashes, was published by the *Journal of Trauma*.

The Maryland CODES (Crash Outcome Data Evaluation System) continues to serve as a contact point for various state and local agencies to obtain data and analyses on various aspects of motor vehicle safety in the state. In addition to routine data requests, data provided by the Maryland CODES staff are used for portions of the Benchmark and Annual Reports compiled by the State's Highway Safety Office. NSC staff members serve on the Traffic Records Coordinating Committee, the State Highway Administration's Strategic Plan update committee, the national Traffic Records Advisory Committee, and Maryland's Partnership for a Safer Maryland. To illustrate the use of both high probability and imputed links in the CODES project, presentations were made at the Maryland Highway Safety Office Annual and Semi-Annual Meetings, the National Traffic Records Forum in Buffalo, New York, and at the CODES Technical Assistance Meeting in Phoenix, Arizona.

As a result of partnerships developed through CODES, the NSC is collaborating with state agencies to make highway safety data available to the public, via the internet, in the form of canned reports and queries. Using the Critical Analysis Reporting Environment (CARE) software, created by the University of Alabama as a web-based program for data analysis, the 2004 Maryland Automated Accident Reporting System (MAARS) database will be the first data set prepared for access by Maryland's Highway Safety Community. Users will have the ability to run frequencies and cross tabulations on selected variables obtained from the crash report. Following the implementation of the MAARS reports, it is anticipated that additional CODES data sets will be made available through the CARE software. The number and type of variables available for analysis will be determined by the host agency of each individual database.

Other CODES-related projects include a longitudinal study of Maryland drivers receiving speeding tickets and an assessment of the effect of graduated licensing systems on risks to both teenage drivers and others sharing the road with them. A paper on speeding now is in press at a scientific journal and a paper on graduated driver licensing is being reviewed by another journal. Outreach and dissemination of study results regarding injuries sustained in motor vehicle crashes continue to be a focus for NSC investigators and research staff. A presentation on planned motorcycle research was made at the Maryland Motorcycle Safety Task Force, in addition to a presentation on graduated licensing at the Maryland Young Driver Task Force. Presentations on speeding and graduated driver licensing research were made at the annual meeting of the American Public Health Association in Philadelphia during December 2005. A speeding presentation also was made at the annual meeting of the Transportation Research Board during January 2006.

NSC investigators are focusing on motorcycle safety as well. The NSC, with funding from NHTSA and Dynamic Science, Inc., has performed a randomized controlled intervention trial to increase licensure rates of Maryland motorcycle owners. For this project, a study cohort was assembled (intervention and comparison groups) and educational materials to encourage licensure were developed and mailed following collaborative meetings with the Maryland Motor Vehicle Administration (MVA), and motorcycle safety and rider groups. Licensure rates in the intervention and control groups were followed and compared through December 2005. Presentations on the findings were given at the North American Congress on Epidemiology in Seattle during June 2006 and at the International Motorcycle Safety Conference in March 2006. A paper on the findings currently is in press. Currently, the NSC is in the third year of a NHTSA-awarded project to characterize the population of motorcycle operators using CODES data and to distinguish factors unique to those who have experienced motorcycle crashes. A paper from this project has been accepted for presentation at a scientific conference. Analysis is also underway to investigate the impact of motorcycle safety classes offered by the MVA. Additionally, NSC staff members are participating in the Maryland Motorcycle Safety Committee, which was awarded an Honorable Mention for Best Practices at the annual meeting of the

Association for Traffic Safety Information Professionals.

In August 2005, the NSC was awarded a contract from the Blue Ribbon Panel for Evaluation of Advanced Airbag Technology to conduct a comprehensive research project to assess the mortality and injury experience associated with changing frontal airbag designs. The study will occur in two phases, with findings to be presented during the upcoming year.

*Occupational injuries:* Supported by funds from the National Institute for Occupational Safety and Health (NIOSH), the NSC continues its surveillance of work-related injuries in Maryland. Recent efforts in this project have included the linkage of multiple databases for calendar years 2001 and 2002. Findings related to these linkage efforts were presented at a meeting of the National Safety Council in Orlando, FL, in September 2005 and at the National Occupational Research Agenda Symposium in Washington, DC, in April 2006. NSC staff is currently conducting a probabilistic linkage of statewide databases for calendar years 2003 and 2004, in an effort to provide an overall description of occupational injuries captured by electronic means in the state.

*Traumatic brain injury:* The NSC is continuing its contract from the U.S. Army to study mild traumatic brain injury and long-term outcomes in Shock Trauma patients with blunt trauma injuries. Patients are given a battery of tests, including an electronic balance test and various neuropsychological and cognitive measures, and follow-up tests are administered to determine which, if any, baseline measures predict those with persistent physical, cognitive, and behavioral problems. To date, 150 subjects have been enrolled and recruitment will continue until September 2006. Findings related to 6-month outcomes were presented at the annual meeting of the U.S. Army in Puerto Rico in May 2006. Preliminary results regarding the rate of improvement in cognitive function and its relationship to the number of symptoms and a measurement of subject well-being were presented at meetings of the American Psychological Association and the International Neuropsychological Society during FY 2006.

*Prehospital care:* A study sponsored by the U.S. Department of Defense is underway to collect vital signs data in trauma patients transported from the scene of their injury through resuscitation at the Shock Trauma Center. The objectives are to determine trauma patient outcomes and identify thera-

peutic interventions between field encounter and completion of resuscitation. This work may result in decision aids for military and civilian prehospital providers to improve the quality of prehospital care, identify emergency surgery needs before hospital arrival, and increase survivability of the seriously injured.

Another study funded by Active Signal, Inc., in which the NSC and MIEMSS collaborated, involved field testing a handheld portable diagnostic assessment system at the scene of injury to determine the extent of a victim's brain damage. Preliminary final results indicated that the portable system is very sensitive to brain disturbance and appears to be unaffected by impairment caused by drug or alcohol use.

*Alcohol and other substance abuse:* The first of several papers documenting the final results of a study supported by the Robert Wood Johnson Foundation and assessing motor vehicle crash culpability relative to alcohol, cocaine, and marijuana use by injured drivers was presented at the annual meeting of the Association for the Advancement of Automotive Medicine (AAAM) in Boston, Massachusetts, during September 2005. Recent additional analyses have documented increased culpability rates among injured drivers at various blood alcohol concentration levels. A paper on these findings has been accepted for presentation at the upcoming annual meeting of AAAM in Chicago, Illinois, scheduled for October 2006.

A clinical trial of the usefulness of brief intervention for 497 alcohol-dependent trauma patients, funded by the National Institute of Alcohol and Alcohol Abuse, sought to determine if a personalized brief intervention would result in decreased drinking and consequences (including injury episodes) from alcohol abuse. The study demonstrated the feasibility of identifying patients with alcohol use problems and delivering an informal brief intervention tool in the hectic and busy environment of a trauma center. The results have been submitted for publication.

*Department of Veterans Affairs:* The NSC also has established collaboration with the War-Related Illness and Injury Study Center of the Washington, DC VA Medical Center. The first project is a pilot study of risky driving behavior among veterans deployed to Iraq and Afghanistan compared with non-deployed veterans and other licensed drivers. Plans are for this study to be expanded to include crashes, first Gulf War veterans, and veterans in other states (provided confidentiality agreements are approved by appropriate regulatory entities at

the Department of Veterans Affairs, University of Maryland, and the states).

### **Training Activities**

The NSC has led the collaborative effort funded by the U.S. Army Telemedicine and Advanced Technology Research Center (TATRC) between the AAIMS Consortium—Airport, Academia (University of Maryland), Industry (Northrop Grumman), Military (U.S. Army, U.S. Air Force, and Maryland National Guard) and State (MIEMSS, Maryland Emergency Management Agency, and the Department of Health and Mental Hygiene, Maryland State Police, Maryland Department of Transportation, and BWI Fire Department)—to conduct tabletop and functional exercises, which will evaluate performance of civilian and military communications in deployment of the Forward Deployable Digital Medical Treatment Facility (FDDMTF) as a triage and communication resource. A successful functional exercise was held in May 2006 at the Baltimore/Washington International Thurgood Marshall Airport. The after-action report from these activities is currently being finalized.

In the summer of 2005, the NSC was awarded funding by the National Institutes of Health, Fogarty International Collaborative Trauma and Injury Research Training Program, for a study of "Injury Prevention Research Training in Egypt." This is a five-year collaborative effort with the Egyptian Ministry of Health and Population and the University of Maryland, Department of Epidemiology, Division of International Health. The objective of this effort is to help the Egyptian Ministry of Health and Population and other Egyptian health professionals increase their knowledge and understanding of injury prevention and apply this knowledge to decrease the significant morbidity and mortality in their country that are caused by injuries. There are a number of areas of collaboration, including courses on basic and advanced injury epidemiology, disaster preparedness, and clinical care of trauma patients. These courses are designed to strengthen injury research within Egypt and the Middle East and to develop and expand capacity and expertise for prehospital care and emergency preparedness in Egypt and throughout the region. In addition, two supplements were awarded to train public health professionals from Iraq and Afghanistan on emergency preparedness and disaster response. So far, over 75 physicians have been trained in these courses during the past year.

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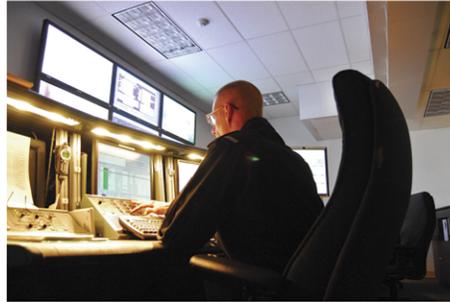
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