Maryland Trauma Leadership
Orientation Resource Manual

Purpose Statement
This resource manual was developed in response to requests made by members of the Maryland Trauma Registry, Education and Prevention Committee of the Maryland Trauma Network. Members identified a need for a systematic information resource to provide reference material related to the Maryland Emergency Medical System /Trauma System. Members also supported the development of an information resource tool to assist Trauma Program Managers, Trauma Coordinators, and Trauma Registrars in the performance of their responsibilities. The Committee determined that it was important to encourage experienced trauma leaders to actively mentor, assist with orientation, and support newly hired trauma staff in any of the Maryland Trauma Centers.

Acknowledgements
The success of this project is attributed to various individuals including Maryland Trauma Center Leadership Staff/Registrars and Maryland Institute for Emergency Medical Services Systems (MIEMSS) staff who collaborated throughout the development process.

The following trauma coordinators/managers/registrars and MIEMSS staff are recognized for their contributions to the process of developing this document:

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Yu Yan – Children’s National Medical Center
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Marla Johnston – Johns Hopkins Adult Trauma Center
Trena Williams – Johns Hopkins Adult Trauma Center
Susan Ziegfeld – Johns Hopkins Pediatric Trauma Center
Katie Manger – Johns Hopkins Pediatric Trauma Center
Rosemary Nabaweesi – Johns Hopkins Pediatric Trauma Center
Deborah Rone – Johns Hopkins Pediatric Trauma Center
Rob Dice – Johns Hopkins Bayview Trauma Center
Susie Burleson – Meritus Medical Trauma Center
Kari Cheezum – Peninsula Regional Trauma Center
Kim Fischer – Peninsula Regional Trauma Center
Tonya Craft – Peninsula Regional Trauma Center
Sandy Waak – Prince George’s Hospital Trauma Center
Robbi Hartsock- R Adams Cowley Shock Trauma Center
Betsy Kramer- R Adams Cowley Shock Trauma Center
Elwood Conaway – Sinai Hospital Trauma Center
Melissa Meyers – Suburban Hospital Trauma Center
Chuck Barrick - Western Maryland Health System Trauma Center
Anna Aycock - MIEMSS
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Mary Beachley - MIEMSS
Cyndy Wright-Johnson - MIEMSS
Kim Auman – National Study Center for Trauma and EMS
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PART 1

MARYLAND EMERGENCY MEDICAL SERVICES
SYSTEMS HISTORY AND BACKGROUND

History & Legislative Background

Resource Management
Maryland Institute for Emergency Medical Services Systems

History & Legislative Background

Resource Management

Maryland Institute for Emergency Medical Services Systems
The Creation of the System

The history of the Maryland Trauma/EMS System begins with the initial Federal initiatives to develop EMS systems in the U.S.
Maryland was one of the original 7 states that were federally funded as demonstration projects for the development of model EMS/Trauma Systems under the EMSS Act of 1972.
The Vision

The Maryland System was created by the vision and leadership of Dr. R Adams Cowley

He was one of the authors of the landmark white paper- *Accidental Death and Disability: The Neglected Disease of Modern Society* (1966)
First Trauma Center

- 2-bed unit on 4E of the U of MD Hospital
- Cases were referred to Dr. Cowley by physicians after the patients had deteriorated & were in shock
- The CENTER was originally known as the “Death Lab”
First Trauma Center

1969 - Opened by Dr. Cowley at University of Maryland Hospital

Birthplace of modern trauma medicine that continues to serve as a National model for care

Maryland Institute for Emergency Medical Services Systems
R Adams Cowley Shock Trauma Center

Maryland Institute for Emergency Medical Services Systems
Public Support for Trauma Centers

- 1973 - Governor Mandel issued an Executive Order to create the Maryland Institute of Emergency Medicine

- 1977 - Senate Bill 852 combined the DEMS and MIEM to create one agency known as MIEMS

- 1978 - Dr. Cowley added “Systems” to the MIEMS now known as MIEMSS
Specialty Referral Centers

Specialty Referral Centers were included in the Maryland EMS System - 1970
Maryland’s Current EMS Law

1993

Maryland Laws Chapter 592  (H.B. 1222)

- Established MIEMSS as independent executive-level State agency
- Created 11 member Governor-appointed State EMS Board
- Created SEMSAC - 31 member Statewide Emergency Medical Services Advisory Council
Key Statutes -- *Since 1991*

1991 - Licensing commercial ambulances

1992 - Funding core EMS System components

1993 - Established Maryland’s current EMS System

1998 - Licensing EMS providers

2001 - Licensing commercial air ambulances

2003 - Funding trauma centers & trauma physicians
1993 - **COMAR 30.08 et seq**

- Regulations specify Standards for designation of trauma & specialty centers
  - Specify process for designation & re-verification of designation of centers
  - Set volume standards for trauma centers

Search **COMAR** Online at

[http://www.dsd.state.md.us/comar/](http://www.dsd.state.md.us/comar/)
EMS Regulations - COMAR Title 30

Subtitle 1: General Provisions
Subtitle 2: EMS Providers
Subtitle 3: EMS Operational Programs
Subtitle 4: EMS Education Programs & Courses
Subtitle 5: EMS Regions & Regional Programs
Subtitle 6: AED Program
Subtitle 7: EMS Communications
Subtitle 8: Trauma & Specialty Centers
Subtitle 9: Commercial Ambulance Services

Maryland Institute for Emergency Medical Services Systems
Trauma Physicians Service Fund

2003 (SB 479)
- Funding established for trauma centers & trauma physicians
  - Through $2.50 surcharge on vehicle registrations, later increased to $10.00
- Prevents the closure of some trauma centers due to a lack of funding
- Established 2-year study of the EMS & trauma system

Maryland Institute for Emergency Medical Services Systems
Trauma Physicians Service Fund

2006 (HB 1164)

- All subspecialties providing trauma care now included
- Reimbursement paid at mid range of Medicare rate
- All elective surgeries related to original trauma injury included
- All hospital based outpatient visits for care related to injury included
Resource Management

EMS system

- Composition:
  23 jurisdictions & Cities of Baltimore & Annapolis

- Staffed:
  by over 27,000 volunteer & career providers

- Calendar Year 2010
  = 665,429 Calls for EMS in Maryland
  = 373,229 EMS Transports
Maryland’s EMS System

- **Ground services provided by:**
  - 9-1-1 responses -- public
    - Over 450 BLS/ALS units
  - Interfacility -- commercial services
    - 238 Licensed BLS units
    - 131 Licensed ALS units

- **Aeromedical services provided by:**
  - Scene -- Maryland State Police
  - Interfacility -- Commercial Aeromedical Services

Maryland Institute for Emergency Medical Services Systems
Resource Management

Receiving Facilities

- 46 Emergency Departments
- 11 Trauma Centers
  - 1 - Primary Adult Resource Center
  - 1 - Level I Trauma Center
  - 4 - Level II Trauma Centers
  - 3 - Level III Trauma Centers
  - 2 - Pediatric Trauma Centers
- 88 Specialty Referral Centers
System Review of Protocol

- Protocol Proposal presented to SEMSAC for comment
- EMS Board Approval
- Publication by MIEMSS
- Education provided by all EMS Jurisdictions
- Implementation
- Feedback to Office of Medical Director
EMS Protocols

- Medical
- Pediatric
- Trauma
- Specialty

http://www.miemss.org
EMS Providers

BLS - Basic Life Support

EMD
First Responder
EMT-Basic

ALS – Advanced Life Support

Cardiac Rescue Technician
EMT Intermediate
EMT-Paramedic

Maryland Institute for Emergency Medical Services Systems
PART 2

MARYLAND INSTITUTE FOR EMERGENCY MEDICAL SERVICES SYSTEMS COMPONENT

Maryland Institute for Emergency Medical Services Systems

MIEMSS

Operational Components
Maryland Institute for Emergency Medical Services Systems

MIEMSS

Operational Components

Maryland Institute for Emergency Medical Services Systems
Maryland’s EMS System

Coordinated by Maryland Institute for Emergency Medical Services Systems (MIEMSS)

- MIEMSS with Board of Physician Quality Assurance sets standards & protocols
- Maryland Medical Protocols for EMS Providers
  - For example, Trauma Decision Tree Algorithm
MIEMSS Mission

Consistent with Maryland law and guided by the EMS Plan, to provide the resources and oversight necessary for Maryland’s statewide emergency medical service system to function optimally and to provide effective care to patients by reducing preventable deaths, disability and discomfort.
MIEMSS Role

Oversees & coordinates all components of Statewide EMS system

- Planning
- Operations
- Evaluation
- Research

- Provides leadership & medical direction
- Conducts & supports EMS educational programs
MIEMSS Role

- Operates & maintains statewide communications system
- Designates trauma & specialty centers
- Licenses & regulates commercial ambulance services
- Participates in EMS-related public education & prevention programs
Organizational Chart

Maryland Institute for Emergency Medical Services Systems

Governor

EMS Board
(11 members appointed by Governor)

Executive Office

Office of the Assistant Attorney General
Monty Magee

Office of the Medical Director
Richard Alcorn, MD

Field Operations and Regional Programs
John Dohnalek

Information Technology and Communications
David Battles

Regions IV

Emergency Operations

Data Management

Information Technology

Communications

Rm. 415

SYSCOM and Emergency Medical Communications Center

Policy, Regulations and Government Affairs

Statewide EMS Advisory Council
(51 members)

Administration
Jeannine Abraham

Pat Guarino
Deputy Director

Compliance
Ron Schaefer

Educational Support Services
Jim Brown

License, Rule Offenders

Stat Office of Commercial Licensing and Regulation

EMS for Children

Gwenith King

Maryland Institute for Emergency Medical Services Systems
Who’s Who --- *Within MIEMSS*

- **Executive Director**
  - Administration
  - Office of the Attorney General
  - Office of the Medical Director
  - Field Operations and Regional Programs
  - Information Technology and Communications
  - Policy, Regulations and Government Affairs

Dr. Robert Bass  
Executive Director
Administration

Mission

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

Maryland Institute for Emergency Medical Services Systems
Office of the Attorney General

Mission

To Provide legal advice to the EMS Board, Statewide EMS Advisory Council (SEMSAC) & MIEMSS

- All aspects of EMS
- Administrative functions of agency
Office of the Medical Director

Dr. Richard Alcorta, Director

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

Maryland Institute for Emergency Medical Services Systems
The Medical Director shall:

- “Be responsible for providing medical oversight of patient care, including emergency medical dispatch …”

- “Approve, participate, & provide medical expertise for the EMS Operational Program in all aspects of the EMS Operational Program which impact patient care, including planning, development & operations …”
The Medical Director is responsible for Monitoring Base Station Hospitals

Establish Criteria for Designation including:

- Personnel & Training Requirements
- Quality Improvement
Field Operations and Regional Programs

- Regions I – V
- Emergency Operations
Information Technology and Communications

- Data Management
- Information Technology
- Communications
- SYSCOM and Emergency Medical Communications
Analysis, Informatics and Research

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.
Information Technology

Mission

To provide leadership, support and guidance to the Institute and Maryland’s EMS community on the use of information technology to improve Maryland’s emergency medical service.
MIEMSS – IT FUTURE

Evaluation
- Structure
- Process
- Outcome

Research
- Efficacy
- Effectiveness
- Cost-Effectiveness

System Changes
New Questions

Effects of Change Assessed
Enhanced Knowledge

Information Systems Data

Maryland Institute for Emergency Medical Services Systems
Information Technology

- eMeds-Electronic Maryland EMS Data System
- eMAIS- Electronic Maryland Ambulance Information System
- CHATS- City/ County Hospital Alert Tracking System
COMMUNICATIONS

Provide the equipment, support and expertise necessary to operate the statewide emergency medical services communication systems and to support public safety interoperability
Communications

**SYSCOM (System Communications)**
- Communications core for helicopter dispatch, coordination & monitoring
- Staffed by EMS & State police operators

**EMRC (Emergency Medical Resource Center)**
- Coordinates medical consultation between EMS providers & emergency departments, trauma centers and specialty centers.
- Provide initial alerting as well as the coordination of resources during major medical incidents.
- Sharing situational awareness of capabilities and capacities of the prehospital system and hospitals.

Maryland Institute for Emergency Medical Services Systems
Policy, Regulations and Government Affairs

- Licensing
  - Compliance
  - Educational Support Services
- State Office of Commercial Licensing and Regulation
- Health Facilities and Special Programs
- EMS for Children

Maryland Institute for Emergency Medical Services Systems
COMPLIANCE

Mission

Ensure the health, safety and welfare of the public as it relates to the delivery of emergency medical services by Emergency Medical Services Provider throughout Maryland
Educational Support Services

Mission

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.
Emergency Medical Services for Children (EMSC)

Mission

Provide leadership, direction & expertise in coordination of resources for children & their families and facilitate efficient & effective delivery of prehospital, hospital & restorative care throughout the state
EMSC – Program System Development

- State Pediatric Emergency Medical Advisory Committee (PEMAC) established 1993 & re-chartered in 2003 with interdisciplinary expansion
- 5 Regional Pediatric EMS Advisory Councils established 1994 - (recommendations on prevention & education)
- AAP representative to State EMS Advisory Committee Statewide Prehospital Protocols reviewed annually. (SEMSAC) legislation passed 1995
- Pediatric protocols integrated throughout BLS & ALS protocols
EMSC - Resources

- Injury & Illness Prevention
- Clinical Protocols
- Standards of Care
- Facility Regulation
- Quality Improvement
- Interagency Collaboration
- Continuing Education
Health Facilities & Special Programs

Mission

Implement the designation and verification processes for trauma and specialty referral centers, provide continuing evaluation of these centers for compliance with the regulations and standards in COMAR 30.08 et seq., and ensure ongoing quality monitoring of the trauma/specialty care system.
Health Facilities & Special Programs

- Primary Stroke Centers
- EMS Base Stations
- Trauma System
- Perinatal Referral Centers
- Cardiac Interventional Centers
OFFICE OF SPECIAL PROGRAMS

Mission

Develop and implement policies, regulations, and programs for the enhancement and improvement of the statewide emergency medical services system and the community.
OFFICE OF SPECIAL PROGRAMS

- Hospital Alert Utilization/ Emergency Department Overcrowding
- Public Access Automated External Defibrillator Program
MARYLAND CRITICAL INCIDENT STRESS MANAGEMENT PROGRAM

Mission
Offer psychological support services to fire fighters, EMTs, and other emergency services personnel involved in emergency operations under extreme stress, and to help accelerate recovery of those persons exhibiting symptoms of severe stress reactions
Quality Improvement

- Regional Medical Directors
- Aeromedical QIC
- Stroke QIC
- CIC (Cardiac Intervential Care) QIC (state)
- Regional QIC
- Trauma QIC
- PEMAC (Pediatric Emergency Medical Advisory Committee)

- Medical Review Committee (MIEMSS)
- Perinatal Advisory Committee
- Regional Councils
- Base Station Hospitals
- Public Safety EMSOP (Emergency Medical Services Outcomes Projects)
- Commercial Ambulance EMSOP

Maryland Institute for Emergency Medical Services Systems
Data Driven Protocol & Quality Improvement for Maryland Prehospital Patient Care

EMS Board (Regulator)

SEMSAC ALS/BLS Committees (Advisory)

Protocol Review Committee (Advisory)

Prehospital Education QIC (Evaluative)

Patient Care Research Studies (Outcomes)

State EMS Medical Director (Medical Review)

Maryland Institute for Emergency Medical Services Systems
Aeromedical Operations

Dr. Douglas Floccare, Director

Mission

Provide physician medical support necessary for MSP Aviation Division to meet the emergency helicopter needs of Maryland’s citizens
Maryland State Police Aviation Division

- Aircraft
  - 11 American Eurocopter Dauphin N3 Helicopters

- Staffing
  - Trooper/Flight Paramedics
  - Uniform/Civilian Pilots
  - Mechanics
  - Support Staff
Commercial Air Ambulances

- **Primary mission**
  - Interfacility transport
  - Staffed by RN and EMT-P

- **Secondary mission**
  - Occasional MSP scene backup
  - Dispatched through SYSCOM
Commercial MEDEVACs

Mission: Interhospital Transfers (IHTs)

- **STAT** *(Johns Hopkins)*
  - Location: Baltimore
  - Crew: Pilot, Flight Nurse & Flight Paramedic

- **PHI** *(UMMC)*
  - Locations: Baltimore
  - Crew: Pilot, Flight Nurse & Flight Paramedic
Legend

MedSTAR Transport
Washington Hospital Center

STAT MedEvac
Center for Emergency Medicine
Of Western PA

Commerical Air Ambulances

Version 5/05

Maryland Institute for Emergency Medical Services Systems
Research Support

The Charles McC. Mathias National Study Center for Trauma and EMS (NSC), STAR-ORC (Shock, Trauma, and Anesthesiology Research – Organized Research Center)

- Located within the University of Maryland School of Medicine
- Maryland Trauma & EMS System’s Primary Research Partnership
- Focus on injury epidemiology, prevention and improving trauma care delivery
- Collaborate with local, state and federal agencies and academic institutions

http://nsc.umaryland.edu
PART 3

MARYLAND EMERGENCY MEDICAL SERVICES SYSTEMS

Maryland Trauma System & Emergency Medical Services

Overview
Maryland’s EMS Program STRUCTURE
Maryland Institute for Emergency Medical Services Systems
Maryland State EMS System Organizational Structure

Maryland Institute for Emergency Medical Services Systems
Maryland Institute for Emergency Medical Services Systems

Structure

Maryland Institute for Emergency Medical Services Systems
EMS Board

- Appoints Executive Director with Governor’s approval
- Appoints advisory committees
- Holds hearings
- Reviews & approves budgets of 5 EMSOF recipients *(Emergency Medical Systems Operational Fund)*
  - MFRI, MIEMSS, MSP, MSFA, Shock Trauma Fund
- Develops, adopts, & implements EMS plan
- Licenses & certifies EMS providers
State EMS Advisory Council (SEMSAC)

- EMS Board appoints 31 members
- Principal advisory body to EMS Board
- Represents regional interests
- Assists with development of EMS plan
- Assists in resolving inter regional & inter state issues
Maryland EMS

- SEMSAC Committees
  - Infection Control
  - Basic Life Support Education
  - Advanced Life Support Education
  - Regional Affairs
All aspects of EMS Care brought together and integrated

- Associate State & Regional Pediatric Medical Directors
- EMS-C integrated with committee structures & protocol input
- Jurisdictional Medical Direction encompasses all levels of providers (ALS, BLS, or EMD)
- Geriatric Subcommittee
- Regional Councils have lay person representation
Other Statewide MIEMSS Advisory Committees

Joint Committee

- Finance
  - JAC - Jurisdictional Advisory Committee
  - CASAC - Commercial Ambulance Services Advisory Committee
  - PEMAC - Pediatric Emergency Medical Advisory Committee
  - TraumaNet - Trauma Center Network
Maryland EMS

MIEMSS Committees

- AED Task Force
- Central Alarm
- EMAIS/eMEDS
- EMD (emergency medical dispatcher – 911 call center)
- Protocol Review
- Regional Medical Directors
- Yellow Alert (*diversion/ED overcrowding*)
- Workforce Task Force
- Numerous Quality Improvement Committees (QIC)
Maryland EMS Regions

- **Region I** – *Western Maryland* -- rural & wilderness areas -- 2 hospitals & 1 trauma center / principally volunteer providers

- **Region II** – *Northwest Central Maryland* near WV, PA, & VA -- transitioning from agriculture to business & industry & residential areas -- 2 hospitals & 1 trauma center - combination of paid & volunteer providers
Maryland EMS Regions

- **Region III** – *Central Maryland* contains 50% of population - 22 hospitals & 4 trauma centers - majority of providers are volunteer with 1 all career jurisdiction (Baltimore City)

- **Region IV** – *Eastern Shore* -- borders on PA, DE & VA - 7 hospitals & 1 trauma center - large shoreline – principally volunteer providers
Region V – 2 principal areas: National Capital Region & Southern Maryland - urban & rural -- 12 hospitals & 2 trauma centers - combination career & volunteer providers in 2 counties adjacent to DC - Southern Maryland - predominately volunteer providers, beginning to hire more career providers to cover rapidly expanding population
PART 4

INFORMATION MANAGEMENT DURING MAJOR EMERGENCIES

Information Management
During
Major Emergencies
Emergency Management

Maryland Institute for Emergency Medical Services System
Maryland Institute for Emergency Medical Services System

MIEMSS Role in Daily Emergency Operations

- Emergency Medical Resource Center *(EMRC)*

- Systems Communication Center *(SYSCOM)*
MIEMSS Role in Multi-Casualty Incidents

**EMRC/SYSCOM** – Become Information Repository For:

- Field Operations Support Team
- Commercial Ambulance Coordination
Emergency Medical Resource Center

Disaster Operations

- Incident Advisement
- Spiral Call Down for ED Availability
- Unusual Occurrences
- NDMS (National Disaster Medical System) Drills
- Anthrax Treatment Protocols
- Resource Cataloging
- Syndromic Surveillance
- Patient Tracking
- Poison Center

Maryland Institute for Emergency Medical Services System
FRED
Facility Resource Emergency Database

Compiling hospital resources statewide

Maryland Institute for Emergency Medical Services System
Patient Triage & Tracking Using FRED

- Incident Site
- Treatment Unit Coordinator
- Priority Red Patients
- Priority Yellow Patients
- Priority Green Patients
- Transportation Group Supervisor
- Transport Unit
- Disposition & Medical Communications
- Staging
- North Hospital
- South Hospital
- East Hospital
- West Hospital

Maryland Institute for Emergency Medical Services System
Reference...

Web Sites

MIEMSS

http://www.miemss.org/Home.htm

MIEMSS – Annual Report

PART 5

EMERGENCY MEDICAL SERVICES
COMMUNICATIONS
EMS
Communications

Maryland Institute for Emergency Medical Services Systems
Maryland Institute for Emergency Medical Services Systems
Communications

SYSCOM (System Communications)
- Communications core for helicopter dispatch, coordination & monitoring
- Staffed by EMS & State police operators
- Located -- 5th floor at MIEMSS

EMRC (Emergency Medical Resource Center)
- Coordinates medical consultation between medic & hospital physicians
- Located -- 5th floor at MIEMSS
Resource Management

♦ Emergency Medical Resources Center (EMRC)
  ▪ FY 2011 – Responded to over 205,000 phone calls and 155,000 radio calls

♦ Systems Communications Center (SYSCOM)
  ▪ FY 2011 – Responded to 25,486 phone & 2,367 radio calls
    ✓ 4,310 were requests for MEDEVAC helicopters
System Communications Center of the Maryland Institute for Emergency Medical Services, a key part of state plans for dealing with disaster management.
Resource Management

MIEMSS maintains the Emergency Medical Resources Center (EMRC) & Systems Communications Center (SYSCOM)

- Serves as link between EMS providers, hospitals, emergency departments & Trauma/Specialty Referral Centers
- EMRC operates in Regions III & V (80% of the population) & is currently being expanded into Regions I, II & IV
- Dispatches Maryland State Police Helicopters

Maryland Institute for Emergency Medical Services Systems
CHATS

- County Hospital Alert Tracking System
- Used to track hospital ED bed availability
- Accessible @ www.miemss.org

Search on REGION

Maryland Institute for Emergency Medical Services Systems
Diversion Policies

- Red & Yellow Alerts for Hospital EDs
  - State Policies
  - Regional Policies
  - Hospital Policies

- Trauma Center Diversions

- System Monitors
  - MIEMSS Monthly Reports
  - Trauma Center Trend Reports
Hospital Base Station Direction

Maryland Institute for Emergency Medical Services Systems
Base Station Physicians

- Provide direction according to Maryland Medical Protocols
- Provide System On-line and Off-line Direction
Pediatric Base Stations

Statewide Medical Direction for Pediatrics Online & Off-Line

Children’s National Medical Center

Johns Hopkins Children’s Center

Maryland Institute for Emergency Medical Services Systems
EMS Documentation

- Pre Hospital Patient Care
- Interagency Communication
- Quality Improvement
- Resource Management
  - EMAIS
  - eMEDS
Maryland eMEDS
Incident Information

Maryland Institute for Emergency Medical Services Systems
Maryland eMEDS
Patient Information
Maryland eMEDS
Patient History
Maryland eMEDS
Vitals Signs and Treatment

Maryland Institute for Emergency Medical Services Systems
Maryland eMEDS
Injury/Trauma

Maryland Institute for Emergency Medical Services Systems
Hospital resources

- Coordinated by MIEMSS
- 46 acute care hospitals provide care to 85% of patients transported by EMS
- Trauma (11) & Specialty Centers (88) care for 15% of patients
Maryland’s Hospital System

Trauma and Specialty Referral Centers

Maryland Institute for Emergency Medical Services Systems
Maryland Trauma System Facilities

Level I
PARC
Neuro Trauma
Pediatric
Hyperbaric
Hand
Eye
ED
STEMI
Cardiac Interventional

Level II

Level III
Perinatal
Burn

EMS System

Maryland Institute for Emergency Medical Services Systems
Comparison
Levels of Trauma Centers

- Differences in levels of trauma centers revolve around availability of physician staff & dedicated resources.

- Quality of care provided to injured patients is expected to be consistent at all designated trauma centers.
<table>
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<tr>
<th>Maryland Requirements for Trauma Centers</th>
<th>PARC</th>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
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<tr>
<td>In-house Attending, fellowship-trained</td>
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<td>Dedicated facilities (RU, OR, ICU)</td>
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<td>Facilities (RU, OR, ICU)</td>
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<td>In-house Trauma surgeon</td>
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<td>x</td>
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<td>On-call Trauma Surgeon</td>
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<td>x</td>
<td></td>
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<td>Dedicated In-house Anesthesiologist</td>
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<td>On-call Anesthesiologist with In-house CRNA</td>
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<tr>
<td>Dedicated In-house Orthopedic Surgeon</td>
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<td>On-call Orthopedic Surgeon</td>
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<td>Dedicated In-house Neurosurgeon</td>
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<td>In-house Neurosurgeon</td>
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<td>On-call Neurosurgeon</td>
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<td>Fellowship-trained and board certified surgical ICU Director</td>
<td></td>
<td>x x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician with privileges in critical care on duty in IUC (24 hours)</td>
<td></td>
<td>x x x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehensive Trauma Research Program</td>
<td></td>
<td>x x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education - Fellowship Training in Trauma</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical Residency Program</td>
<td></td>
<td>x x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outreach Professional Education</td>
<td></td>
<td>x x x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>INITIAL Designation (Echelons of Care Standards)</td>
<td>INITIAL Designation under COMAR 30.08, et.seq.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Johns Hopkins Bayview Medical Center</strong></td>
<td>1975 City Hospital Baltimore Regional Burn Center</td>
<td>1998 Burn Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Johns Hopkins Hospital Wilmer Eye Center</strong></td>
<td>1975 Eye Trauma Center</td>
<td>2000 Eye Trauma Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>R Adams Cowley Shock Trauma Center</strong></td>
<td>1980 Neurotrauma Center</td>
<td>2003 Neurotrauma Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Union Memorial Hospital Raymond M. Curtis Hand Center</strong></td>
<td>1975 Hand Center</td>
<td>State Resource Center of Excellence</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>R Adams Cowley Shock Trauma Center</strong></td>
<td>1975 Hyperbaric Medicine Center</td>
<td>State Resource Center of Excellence</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Trauma Specialty Centers**

**Historical Overview**
<table>
<thead>
<tr>
<th>Hospital</th>
<th>INITIAL Designation Echelons of Care Standards</th>
<th>INITIAL Designation under COMAR 30.08, et.seq. 1997/98 &amp; 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>R Adams Cowley Shock Trauma Center</td>
<td>1973 Shock Trauma Center</td>
<td>2008 Primary Adult Resource Center -- PARC</td>
</tr>
<tr>
<td>Johns Hopkins Hospital</td>
<td>1975 University Trauma Center</td>
<td>2008 Level I</td>
</tr>
<tr>
<td>Johns Hopkins Children's Center</td>
<td>1975 – Regional Trauma Center for Children</td>
<td>2000 – Level I Pediatric Trauma Center</td>
</tr>
<tr>
<td>Johns Hopkins Bayview</td>
<td>1975 – City Hospital Area-Wide Trauma Center</td>
<td>2008 Level II</td>
</tr>
<tr>
<td>Sinai Hospital of Baltimore</td>
<td>1975 Area-Wide Trauma Center</td>
<td>2008 Level II</td>
</tr>
<tr>
<td>Suburban Hospital</td>
<td>1978 Area-Wide Trauma Center</td>
<td>2008 Level II</td>
</tr>
<tr>
<td>Prince Georges Hospital</td>
<td>1978 Area-Wide Trauma Center</td>
<td>2008 Level II</td>
</tr>
<tr>
<td>Peninsula Regional Medical Center</td>
<td>1978 Area-Wide Trauma Center</td>
<td>2008 Level III</td>
</tr>
<tr>
<td>Meritus Medical Center (previously Washington County Hospital)</td>
<td>1980 Area-Wide Trauma Center</td>
<td>1998 - 2003 - Level II 2003 - Level III</td>
</tr>
<tr>
<td>Western Maryland Health System</td>
<td>1981 Area-Wide Trauma Center</td>
<td>2008 Level III</td>
</tr>
<tr>
<td>Children’s’ National Medical Center – Washington, DC</td>
<td>1985 Out of State Pediatric Trauma Center</td>
<td>2002 - MOU</td>
</tr>
</tbody>
</table>
Designation Process

- Application
- On-site review
- Final report
- Ongoing quality monitoring
- 5-year re-verification
EMS Injured Patient Distribution

- Specialty Referrals: 5%
- Areawide Trauma Centers: 10%
- Local ED: 85%
### Top 10 Destinations of Trauma Patients Discharged to Inpatient Rehabilitation Facilities

*(June 2010 thru May 2011)*

<table>
<thead>
<tr>
<th>Rehabilitation Center</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kernan Hospital</td>
<td>476</td>
</tr>
<tr>
<td>Genesis Long-Term Care Facilities</td>
<td>128</td>
</tr>
<tr>
<td>University Specialty Center</td>
<td>82</td>
</tr>
<tr>
<td>Maryland General Hospital</td>
<td>79</td>
</tr>
<tr>
<td>Sinai Rehabilitation Center</td>
<td>56</td>
</tr>
<tr>
<td>Adventist Health Care</td>
<td>39</td>
</tr>
<tr>
<td>Good Samaritan Hospital of MD</td>
<td>39</td>
</tr>
<tr>
<td>Future Care</td>
<td>35</td>
</tr>
<tr>
<td>Meritus Medical Center Comprehensive Inpatient Rehabilitation Services</td>
<td>35</td>
</tr>
<tr>
<td>National Rehabilitation Hospital, Washington, DC</td>
<td>30</td>
</tr>
</tbody>
</table>

*Note: Total patients ages 15 & over who went to a rehabilitation center = 1,721*

*Source: MIEMSS Annual Report 2010 - 2011*
PART 7

ROLE OF THE TRAUMA CENTER SYSTEM MANAGER

The Role of the Trauma Coordinator System Manager
The Role of the Trauma Program Manager

Maryland Institute for Emergency Medical Services Systems
Trauma Program Manager Role as Defined in **COMAR 30.08.05.03(4)**

Monitors & Coordinates components of trauma program including:

- Patient care
- Provider education
- Public education
Trauma Program Manager Role as Defined in **COMAR 30.08.05.03(4)**

Monitors & Coordinates components of trauma program including:

- Program management according to trauma center’s need
- Trauma Registry
- Quality management for trauma program

Maryland Institute for Emergency Medical Services Systems
Examples of Responsibilities

- Coordinates all designation activities
- Monitors & evaluates hospital’s compliance with trauma system’s regulations
- Oversees trauma registry
- Participates in State Trauma Quality Improvement Committee (Trauma QIC)
Relationships

- Reporting
  - Direct supervision
  - Indirect consulting
- Collaboration
- Communication

Maryland Institute for Emergency Medical Services Systems
Relationships

Cooperation with

- Trauma Director
- Emergency Department
- Ancillary Departments
- Other Medical Staff
- EMS Providers
Activities

- Meetings - Meetings - Meetings
- Resource to trauma team
- Oversight of QA/PI activities for Trauma
- Interface with EMS providers & community
- Participate in injury prevention activities
- Participate with State trauma system activities (TraumaNet, MTREP, Trauma QIC)
- Interface & collaborate with all hospital departments & staff involved with trauma care

Maryland Institute for Emergency Medical Services Systems
Activities

- Participates in hospital leadership activities
- Viable partnerships with federal, inter- & intra-state, county, municipal governments, & community based agencies
Priority Meetings

Regional EMS Advisory Council

Provides recommendations to MIEMSS from local regions that have representation from communities that include EMS providers, consumers, hospitals, health departments & other public safety & healthcare providers

Maryland Institute for Emergency Medical Services Systems
Priority Meetings

Maryland Trauma Network (TraumaNet)

- Principal deliberative body for issues affecting:
  - designated trauma centers
  - specialty care centers in Maryland
- Addresses issues primarily related to system-wide delivery of trauma care
- Serves as an advocacy & advisory group for trauma system legislation
Priority Meetings

Maryland Trauma Registry, Education & Prevention Committee (MTREP)

- A committee of TraumaNet that has representatives (trauma coordinators & managers) from each trauma center
- Meets monthly with MIEMSS staff to discuss & problem-solve issues related to trauma registry, education & injury prevention

Maryland Institute for Emergency Medical Services Systems
Priority Meetings

Trauma Quality Improvement Committee
(Trauma QIC)

- Quality Improvement Committee of MIEMSS addresses system-wide quality improvement related to trauma care
- Chairperson appointed by MIEMSS Executive Director
- Members are represented from each trauma center
- Meeting deliberations are confidential
PART 8

TRAUMA REGISTRY

Trauma Registry

& “Collector”
Maryland Institute for Emergency Medical Services Systems

Trauma Registry

& “Collector”

Maryland Institute for Emergency Medical Services Systems
Trauma Registry -- Background

MIEMSS Developed - early 1980’s to identify trauma patients in all Statewide trauma centers.

- Initial process was to submit data (3-page document) via “dumb” terminal
- Mid 1980’s - process revised to PC based collection system with each trauma center submitting data to State via data base program
Trauma Registry -- Background

MID 1980’s

- MIEMSS & NSC combined efforts to analyze procedures & develop a more user friendly registry system
  - Used CDC’s recommended minimum data set for collection of trauma related data as a starting point
  - Defined 10 reports needed to evaluate quality of care at both State and institutional levels.
  - Worked in collaboration with software company - Tri-Analytics (Digital Innovations)
Trauma Registry -- Background

MIEMSS & NSC MID 1980’s Collaboration

- 10 reports drove the data points that were needed to run these reports
- Data dictionary developed to define each data points to ensure inter-institutional interpretation was consistent
- Data dictionary now available on-line at the MIEMSS web site

http://www.miemss.org
Trauma Registry -- Background

**MTREP** (Maryland Trauma Registry/Education/Prevention Committee)

- Trauma Net Committee
- Continues to review & revise the Trauma Registry as needed to keep pace with new trauma treatments & protocols
Tri-Analytics developed the software "Collector"

- Collector was developed in the early 1990’s
- Collector is used today by each trauma center, adult & pediatrics, to collect & report their trauma population to the State
Information Collected via “Collector”

- **Demographics** - Age, gender, residence, etc.
- **Pre-Hospital** - Patient origin, scene vs-transfer, vital signs, treatments, mechanism of injury, e-codes, ambulance information, time of injury, transport times, etc.
- **ED data** - Time of arrival, treatments, vital signs on arrival & discharge, toxicology information, etc.
Trauma Registry

Information Collected via “Collector”

- **Clinical data** - OR information, procedures, ICU days, co-morbidity, complications, blood product usage, etc.

- **Discharge data** - Discharge date & time (used to calculate LOS), final disposition, deaths, autopsy numbers, DNR status
Trauma Registry

Information Collected via “Collector”

- **Anatomical Injuries** - detailed descriptions of injuries are entered as text & then coded *(by pressing the ‘Code’ button to automatically code for ICD-9 & AIS which are used to calculate ISS and TRISS.)*
  
  ICD-9 codes combined with other data points are used in various standard quality reports.

- **Comments** - Used by institutions *(not transmitted to the State)* for internal QI loop closure, etc.
Trauma Registry

Trauma Registry data can be extracted to:

- Look at the number & types of injuries seen at Maryland’s adult & pediatric centers as a Statewide system or at each institution
- Use as an evaluation tool both for Statewide system & for each institution
- Provide health care professionals with answers to questions for research, education, statistical purposes, etc.
- Determine type of prevention programs that could be useful throughout State
Trauma Registry

- MIEMSS’ Confidentiality protects both patient & trauma center(s)
- While non-confidential data can be released much easier than confidential data, neither can be released without prior MIEMSS approval
- HIPPA Laws also affect maintenance & release of any and all data
Uses of Collector

- Transfer data to MIEMSS (quarterly)
- Data used by State to monitor programs
- Data used by individual centers to monitor trauma program, research, etc.
Working with Trauma Registry

Have on hand...

- Data Dictionary
- “Collector Cookbook”
- AIS Book – 1990 and/or 1998 version
- ICD-9 Manual with Volumes 1, 2, & 3
- MIEMSS Annual Report
- User Conference – query list
- Etiology Coding Hints – Part I and II
- Phone Number of Digital Innovations 1-800-344-3668

Maryland Institute for Emergency Medical Services Systems
Data Transfer

- External – To MIEMSS Quarterly
- Internal – Outcomes Software
A patient is only considered a readmission if the patient returned due to a complication from the original injury.

Enter date of birth, if known. Only enter age if date of birth is unknown. If entering age, enter age type.

Enter "Y" to indicate where the patient was identified as a trauma patient. If no alert was called, enter "N" in all the trauma alert fields and "Y" in "None".

SCREEN 1.1

Maryland Institute for Emergency Medical Services Systems
A pt. is only considered a tx. if the pt. came from another acute care fac. by helo. or ambo. If the pt. came from a different source, enter "other".

For Runsheet #1, enter the MAIS # for the first responder at the scene. If a second ambo was called and it transported the pt. to the hosp, enter that MAIS number in Runsheet #2. Enter the Helicopter ID (or Trooper #) if the patient was taken by helicopter to the hospital.

SCREEN 2.1
For any type of injury, enter up to 3 prot. equip. Enter "none" if no equip. was used. Assume the equip. was used correctly unless otherwise mentioned.

The primary and secondary injury types should correspond to the primary and secondary e-codes.

Enter up to 3 types of airbags, if deployed and pt. was in an auto crash.

If the pt. was a transfer, the ambulance dates and times here should be the dates and times the pt. was taken to the initial hospital.

SCREEN 2.2

Maryland Institute for Emergency Medical Services Systems
For all respiratory rates: enter number of spontaneous (unassisted) respirations. If the pt. was intubated, enter "1". If the pt. was bagged and in full arrest, enter "0".
If the pt. was a tx, enter the mode of transport to your hospital and the time the ambo. left the transferring hospital.

Enter the initial vitals from the transferring hospital.

SCREEN 2.4
Enter a short narrative of the injury event including how injury occurred, protective equipment used, and any other relevant details.
Enter "Y" to all that apply.
For numbers 23-40, the user may enter any additional mechanisms of injury that he/she would like to track.
If the pt. was admitted to the hosp., enter the date and time the decision was made to admit the pt.

Enter the number for the response for this pt. that corresponds to your hospital's response level.
Enter the services or the names or codes of the other physicians involved in the care of the pt.

Whether the pt. or the surgeon arrived first, always enter the time the surgeon arrived.
Enter the initial set of vitals taken in the emergency dept.

SCREEN 3.3

Maryland Institute for Emergency Medical Services Systems
SCREEN 3.4

Refer to Tri-Code portion of the Collector manual.

This feature allows the user to copy the initial diagnosis text to the final diagnosis text.
When > 20 procedures were performed, if there are duplicates, enter only once to allow 20 different proc. to be entered. If there are still more than 20, enter the most relevant procedures.
Enter the last set of vitals taken in the ED

Enter "Y" if there is documentation of pain assessment in the ED in the pt's. medical record. If the pt. was unconscious, enter "N/A".
Here, "Via" means "by way of". Example: from OR to ICU via OR recovery room - OR Disposition = ICU and Via = OR Recovery Room.

Enter the ICD-9 procedure codes here, if applicable.
SCREEN 4.1.2

SECTION IV  CLINICAL MANAGEMENT

2nd OR Arrival  07/12/1988  @ 16:08
2nd OR Procedures:
12.45

2nd OR Disposition  03  Via  05
2nd OR Visit Physicians:
1)  
2)  
3)  

Maryland Institute for Emergency Medical Services Systems
SCREEN 4.1.3
SCREEN 4.1.4
List all relevant OR procedures after the first 4 visits to the OR.
Enter procedures done not in the ED but rather those done during the pt's. hospital stay.
SCREEN 4.4

Maryland Institute for Emergency Medical Services Systems
Unplanned visits can occur any time during the pt's. hospital stay.

Enter "Y" if there is documentation of pain assessment in the ICU in the pt's. medical record. If the pt. was unconscious, enter "N/A".
Use NTDB and/or ACS complication codes. Only use an ICD-9 complication code when there is no corresponding NTDB or ACS complication code.
List only the blood products used either within the first 24 hrs. or between 24 and 72 hrs. of patient arrival.

This data element is only accessible if injury type = "burn". List description of burn injury in anatomical diagnosis field (screen 6.1).

SCREEN 4.7
If a pt. came from a long-term care fac. and returned to same, choose "scene" for origin and "home" for final disposition.

If the pt. was transferred, enter the reason in "Basis for Transfer". Only use "Transfer Reason" if the reason is not listed in "Basis for Transfer".

If a pt. died, enter autopsy id #, "unknown", or "n/a". Do not leave blank.
This page is institution-driven.
Maryland Institute for Emergency Medical Services Systems

SCREEN 6.1

Refer to Tri-Code portion of the Collector manual.
This screen will be generated by the software.

INJURY DESCRIPTION
edits made to this field are also reflected in original field

qsw - penetrating to abdomen with altered mental status

Scores Summary (Resize window to view results)

MAXIMUM AIS: 4
Body Region:
1. Head or neck
2. Face
3. Chest
4. Abdomen 4
5. Extremities 2
6. External

Which yields an ISS of 20 and combines with an admission RTS of 7.550 to give a TRISS of 0.9817.

The ASCOT Score is 0.9865.

The patient origin is SCENE OF INJURY.

The patient met the following pre-hospital protocol categories:
A C D
The "Comments" section is for the trauma coordinator's use and does not get sent to MIEMSS when a transfer is done.
This screen can be used to link to "*.jpg" or other types of files.
Enter initial set of vitals taken in ED.

Airway, Open Wound Type, Skeletal Injury Type, and PTS (or Pediatric Trauma Score) are fields that appear in this screen only if you are using the Pediatric version of Collector. PTS is a field that will automatically be calculated once systolic blood pressure, GCS, airway status, skeletal and wound types have been entered.

Screen 3.3 (with Pediatric Element Explanation Text Boxes)

Maryland Institute for Emergency Medical Services Systems
Maryland Institute for Emergency Medical Services Systems

The treatment list corresponds to the list used in prehospital, transferring hospital & ED sections.

<table>
<thead>
<tr>
<th>Screen 4.8 PED</th>
<th>Data Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ICU Data</strong></td>
<td>First Visit Date</td>
</tr>
<tr>
<td><strong>Treatments:</strong></td>
<td>, , ,</td>
</tr>
<tr>
<td><strong>Procedures:</strong></td>
<td>, , ,</td>
</tr>
<tr>
<td><strong>PIMC Data</strong></td>
<td>First Visit Date</td>
</tr>
<tr>
<td><strong>Treatments:</strong></td>
<td>, , ,</td>
</tr>
<tr>
<td><strong>Ward Data</strong></td>
<td>First Visit Date</td>
</tr>
<tr>
<td><strong>Treatments:</strong></td>
<td>, , ,</td>
</tr>
<tr>
<td><strong>Current Medications:</strong></td>
<td>, , ,</td>
</tr>
</tbody>
</table>
Add/Modify = Add record or use various parameters to search for existing record.

Modify/View Record = Review or change pt information within an already created record. The record can be opened by using either the Trauma Number or the visit number and the History number together.

Delete Record = Once a record is deleted it is unrecoverable. The user will be prompted to make sure that the record should be deleted.

Browse Records = Used to view a subset of records by either date or range of trauma numbers or by using a query.
Standard Reports

Maryland Institute for Emergency Medical Services Systems
1. Insert “Report” Name.
2. Select “Query” or leave blank to include everyone.
3. Select “Output” source - information can be viewed “on screen” or printed or saved to file. If “File” selected, create a file name.
4. Select “Run” to view screen “specify patients.” Select either range of registry numbers, ED arrival date or discharge date. Pay attention to the active & closed status to ensure accuracy of report statistics.

Standard Reports
Data Element Hints

When PT arrives from scene --

☑ Enter mode of transport in Data Element “Transport Mode From Scene” (TRANSP_S)

When PT transferred to your facility --

☑ Enter mode of transport in Data Element - “Transport Mode Upon Transfer,” (TRANSP_R) &, if known, enter mode of transport to original receiving hospital in “Transport Mode From Scene” (TRANSP_S)
Several Registry fields are calculated as the Data Elements are entered. For pediatric centers, the PTS is calculated.

Some of these are:

- RTS
- Age Type
- Time in Field
- Initial and Final Injury Severity Score
- TRISS
- Age
- Time on Scene
- Length of Stay
- Time in ED
Data Element Hints

- Use military time for all Registry times. Midnight is entered as 00:00
- Use “* or U” for unknown and “/” for not appropriate/not applicable
- Certain Data Elements are listed only in the Pediatric Registry & will not appear in Adult Registry screens
Several fields have multiple selections available via a “drop-down menu.” Simply “click” on the appropriate choice.

To Enter the “E-Codes”, use “pop-up menus” within Collector or use the ICD-9 Manual.
Data Element Hints

- Injuries:
  - Refer to AAAM AIS book to obtain information on coding for severity
  - OR
  - Refer to Collector manual or “HELP” in application for more extensive explanations and definitions
Data Element Hints

- Read ENTIRE chart to obtain most accurate & detailed information as possible
- Enter 1 injury per line. Include as much detail as available. Don’t guess. If not documented, it Must Not be assumed
- Certain descriptions of signs & symptoms can be attributed to an injury i.e., ‘raccoon eyes’, &/or hemotypanium, are classic sign(s) of a basilar skull fracture & can be coded as such if no further detail is documented
- List ALL injuries or the predominate 27
Data Element Hints

- Don’t include r/o’s, complications, or pre-existing conditions with injuries. These are documented in their own sections.
- Include PT’s age on the 1st line only if age is <15 years (Collector automatically does this).
- Spinal fractures with cord involvement must be on the same line in Collector for ICD9 code to be accurate.
Data Element Hints

- Cerebral contusions, if bilateral, must be identified in order to reflect accurate severity
- Severe pelvic injuries (*open book, blood loss >20%) must be coded manually to reflect accurate severity
- Remember, most hospital coders are coding for reimbursement purposes, not for severity

Maryland Institute for Emergency Medical Services Systems
Data Element Hints

- Use the “@” at the beginning of line if there is an entry that will not be factored into ISS calculation – i.e. @CPR PTA

- If all injuries are related to a penetrating mechanism, enter penetrating location of injury on first line – i.e., GSW to chest
Closing a Record (Checking a Record)

Prior to data submission to State Registry, each record must be validated. To validate or “check” a record, click the Check button ✓ in the lower left area or press ALT and K keys simultaneously while in Data Entry mode.

The Checks Window will notify you of any problems with your data.
If there are problems with the record, Edit to either fill in missing data or correct the data and an “OK” message will appear in the Checks window. Click Next Check to move to the next Check.
If the data are correct, or no data are available, click Validate Check to override the check & move on to the next check. Once the record has passed all checks, you will be prompted to close the record.

Click “Yes” to close the record or no to keep it active.
PART 9

TRAUMA PROGRAM IMPROVEMENT
Principals of Trauma Program Improvement

Maryland Trauma Nurse Coordinator Orientation
Performance Improvement and Patient Safety (PIPS)

- Continuous multidisciplinary effort to
  - Measure
  - Evaluate
  - Improve the process of care and its outcome
- Reduce inappropriate variation in patient care
- Improve patient safety
<table>
<thead>
<tr>
<th>PIPS Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reliable data collection with valid objective data</td>
</tr>
<tr>
<td>• Demonstrates Performance I supported by trauma registry</td>
</tr>
<tr>
<td>• Multidisciplinary review occurring at regular intervals</td>
</tr>
<tr>
<td>• Results must define corrective strategies and be documented</td>
</tr>
<tr>
<td>• Evaluation of the effect of the change</td>
</tr>
</tbody>
</table>
Characteristics of an effective PIPS program

- Authority and accountability
- Well-defined organizational structure
- Appropriate, objectively defined standards to determine quality of care
- Explicit definitions of outcome derived from relevant standards
Key Positions

• Trauma director
  – Set qualifications for trauma service members
  – Recommend changes for trauma panel based on performance review

• Trauma program manager
  – Logistic information
  – Coordination of daily data processing
  – Monitoring of effectiveness of interaction of all involved services
Three Basic Components of Performance Improvement

- System of care
- Morbidity
- Outcome

Value = \frac{Quality of process + Quality of outcome}{Cost}
Process Measure Examples

- Compliance with guidelines / protocols / pathways
- Appropriateness of prehospital / emergency department triage
- Delay in assessment / diagnosis / technique / treatment
- Error in judgment / communication / treatment
- Appropriateness and legibility of documentation
- Timeliness and availability of X-ray reports
- Timely participation of subspecialists
- Availability of operating room / acute and subacute
- Timeliness of rehabilitation
- Professional behavior
- Availability of family services
- Insurance carrier denials
- Consistency of outpatient follow-up
- Admission of trauma patient to nontrauma service
Outcome Measure Examples

- Mortality
- Morbidity surveillance (complications)
  - ACS
  - MIEMSS
  - Facility
- Length of stay / ICU and total hospital stay
- Patient safety initiatives (next slide)
- Cost
- Quality of life
- Patient satisfaction
Patient Safety Examples

- Wrong site / wrong patient / wrong procedure avoidance initiatives
- Multidisciplinary trauma committee
- Performance improvement program
- Patient safety program
- Computer-based provider order entry
- Evidence based hospital referrals
- ICU physician staffing
- DVT prophylaxis
- Peri-operative B-blocker use
- Peri-operative antibiotic use
- VAP Bundle
- Pressure ulcer prevention
- Outpatient self-management for warfarin anticoagulation
- Early appropriate enteral nutrition in ICU patients
- Antibiotic-impregnated central venous catheters
Data Collection

• Trauma Registry
  – Participation in hospital / state / national databases
  – Comparative analysis / benchmarking opportunities
  – Accurate data collection by trauma staff via manual abstraction and electronic transfer
  – Data validation
Concurrent Care Evaluation

- Monitor concerns regarding patient care utilizing
  - Nurse managers
  - Case managers
  - Hospital wide PIPS coordinators
  - Pathway / protocol coordinators
  - Patient advocacy personnel
  - Risk management
  - Daily rounds
Structured Review Processes

- Focused audits
- Structured reports
- Minutes from performance review and educational processes
Performance Review and Educational Programs

- Review the performance of the trauma program
- Review patient safety
- Provide focused education
- Provide peer review (including general and specific M&M reviews)
- Identify recurrent trends requiring multidisciplinary peer review

Maryland Institute for Emergency Medical Services Systems
Trauma Program Operational Process Performance Committee

- Multidisciplinary committee to address trauma program operational issues
- Examines trauma-related hospital operations
- Including representatives from the continuum of care including prehospital and disposition entities
- Identify problems
- Documentation reflecting review of operational issues and any analysis and proposed corrective actions
- Demonstrate problem resolutions (loop closure)
## Trauma Peer Review Committee

- Familiarity with state laws governing discovery
- Minutes document a candid discussion
- Participants
  - General surgery
  - Orthopaedic surgery
  - Neurosurgery
  - Emergency medicine
  - Anesthesia
- 50% attendance requirement

- Review
  - Deaths
  - Complications
  - Sentinel events
- Mortality review
  - Mandatory review of all deaths
  - Categorized
    - Preventable
    - Nonpreventable
    - Potentially preventable
Corrective Action

- Guideline / protocol / pathway development and revision
- Targeted education / rounds / conferences / journal clubs
- Enhanced resources / facilities / communication
- Process improvement team implementation
- Counseling
- Peer review presentations
- Change in provider privileges / credentials
- External review
Closing the Loop

• Demonstrate that a corrective action has the desired effect as determined by continuous evaluation.

• Although some process loops may never be completely closed, all trauma program should demonstrate the continuous pursuit of performance improvement and patient safety.
Automated Notification of Completed Autopsy Reports

• Each institution has set up a generic email address for notification that is not linked to an individual and will not change when personnel change.

• Elements contained in notification include: *autopsy case number, name, age, sex, race, date & time of death, cause/manner of death, and Medical Examiner’s name and contact number*

• For questions about automatic notification, contact Mike Eagle, Information Technology at 410-333-3250 or 410-333-4893.
Process for Obtaining Autopsies

Phone

- Call (410) 333-3250
- Request to be transferred to the ME or Fellow who is responsible for the case
- Speak directly with ME or Fellow to obtain preliminary autopsy findings
Process for Obtaining Autopsies

Written request

- Include patient name, date of arrival at your institution, date of death & your return address
- Office of the Chief Medical Examiner
  Attention: Information Desk
  900 W. Baltimore Street
  Baltimore, MD  21201
Maryland Institute for Emergency Medical Services Systems

Resources / Tools

- COMAR -- Maryland Trauma Center Regulations (30.08.05 et. seq)
- American College of Surgeons (ACS) Resources for the Optimal Care of Injured Patient
- Society of Trauma Nurses (STN) TOPIC course
Maryland Institute for Emergency Medical Services Systems

**TOOLS**

- **ACS Trauma PI Guideline** – available on web
- **Standard reports** - available in Collector and Collector Outcomes
- **User-defined reports and queries** – user developed in Collector to monitor various indicators
- **Tables/graphics that reflect changes over time** (see examples in workbook)
**Trauma Quality Improvement Program (TQIP)**

- Provides risk-adjusted benchmarking of designated/verified trauma centers to track outcomes and improve patient care.
- Utilizes the infrastructure of the National Trauma Data Bank (NTDB) to collect valid and reliable data, provide feedback to participating trauma centers, and identify institutional characteristics that are associated with improved outcomes.
- Builds upon this existing infrastructure through enhancements in the following areas: *data collection, benchmarking, and identifying structures and processes of care*.
PERFORMANCE IMPROVEMENT WORKSHEET – Example Printed from Collector

Name S, R                                           Registry# 18761

DEMOGRAPHICS
Name S, R    DOB 04/02/1932    Age 72 Years    Race White    Gender Male
SS # 214-28-9405
Inclusion Criteria 2.1 History# 1695584 Visit # - 1 Readmit? N
Account# 030398861    Registry# 18761

SCENE AND TRANSPORT
Patient Origin Scene of Injury   Scene Interval n/a    EMS Interval n/a (HH:MM)
Primary Cause Motor Vehicle Accident      E813.0 Protective Equipment Seatbelt
Primary Injury Type Blunt
Mode of Arrival Public Ambulance-ALS    EMS Priority 2
Pre hospital Vital Signs - BP 175/111 Pulse 78 Resp 12 GCS 13 (4/6/3) yielding
  RTS of 7.84 (stable)

RESUSCITATION
Arrival Date 07/01/2004  Time 12:00   Response 2    Trauma Surgeon 6107
ED Attending    n/a
Arrival Vital Signs - BP 179/108 Pulse 72 Resp 18 GCS 15 (4/6/5) yielding
  RTS of 7.84 (stable)
ED Disposition Floor Date 07/01/2004 Time 18:00 Lapse 6:00 (HH:MM)

HOSPITAL STAY AND DISPOSITION
Admission Date 07/01/2004 Time 16:20 Service Trauma Service
Admission Attending 6109
Discharge Date 07/02/2004 Time 13:30 Disposition Home   LOS 1 days
  ICU Stay 0 days

INJURIES, SCORES, PRE-EXISTING CONDITIONS, AND OUTCOME
Final Injuries
  HEAD LACERATION, BRAIN CONTUSION, CONCUSSION
ISS 9  TRISS 96.8% Survivable    ASCOT 97.1% Survivable    Status Alive
Maximum AIS in BR1 3; BR2 n/a; BR3 n/a; BR4 n/a; BR5 n/a; BR6 n/a
Anatomical Profile Scores: A 3.00; B 0.00; C 0.00; D 1.00
Pre-existing Conditions IIIIII
Ethanol 0 Drug Screen n/a (+ or - for any screened drug)

BLOOD PRODUCT USAGE
Auto transfusion n/a Cross matched RBCs n/a Uncross matched RBCs n/a FFP n/a
Cryoprecipitate n/a Platelets n/a Colloid n/a Other n/a

OPERATIVE INTERVENTIONS AND PROCEDURES
OR #1 Date and Time n/a

ACS AUDIT FILTERS IDENTIFIED FOR THIS PATIENT
COMPLICATIONS IDENTIFIED FOR THIS PATIENT
No PREHOSPITAL complications identified
No HOSPITAL complications identified (does not include Pre hospital Complications)
PART 10

TRAUMA REGISTRAR
TRAUMA REGISTRAR
TRAUMA REGISTRAR
Roles and Responsibilities

- Maintains a database unique to trauma
- Identifies, collects, codes, scores, and enters data into the registry;
- Participates in follow-up of registry related issues;
- Supports performance improvement and injury prevention programs;
- Runs reports as requested to support research activities;
- Must be thoroughly knowledgeable about ICD-9 and 10 coding, medical terminology, pathophysiology, data management, presentation software functionality, statistics, anatomy and the trauma patient care process

Roles and Responsibilities may differ from center to center.
TRAUMA REGISTRAR
Supervision and Training

- Trauma Registrars should be supervised by and report to the Trauma Program Manager.
- The American College of Surgeons (ACS) suggests one full-time registrar for each 750 – 1,000 admissions per year.
- ACS recommends 4 hours of trauma registry related education per year.
- Must take responsibility for continuing self education to remain current.
- Attends monthly Maryland Trauma Registry, Education and Prevention (MTREP) committee meetings.
- American Trauma Society offers a Basic and Advanced Trauma Registry Course.
TRAUMA REGISTRAR
Certification - CSTR

- Certified Specialist in Trauma Registry credential by examination (CSTR)
- Requirements to sit for the CSTR exam:
  - A minimum high school diploma or equivalent
  - At least 2 years of full-time or equivalent (4,000 hours) experience in trauma registry practice
  - Completion and filing of an Application for the Certification Examination for Trauma Registrars
TRAUMA REGISTRAR

Certification - CAISS

- Certified Abbreviated Injury Scale Specialist which teaches the coding of traumatic injury (CAISS)

Requirements to sit for CAISS exam:
- Abbreviated Injury Scaling course should be completed
- At least one year of coding experience accumulated to understand coding thought process
- Must be able to accurately code in all 6 body regions
TRAUMA REGISTRAR
ATS – Basic Trauma Registrar Course

- **Learning Objectives**
  - Identify fundamentals of a Trauma Registry, including patient inclusion criteria and data validation
  - Identify basic principles of Inter-Rater audits
  - Identify process of reviewing and abstracting medical records of trauma patients
  - Identify the basic principles for various scaling and scoring tools
  - Understand the assignment of injury severity values
  - Familiarize participants w/ computer hardware and software commonly used in the registry
  - Discuss Process and Quality Improvement
  - Understand significance of confidentiality concerning patient data
TRAUMA REGISTRAR
ATS – Advanced Trauma Registrar Course

- Learning Objectives:
  - Explain ICD-10-CM coding background; utilize ICD-10-CM coding of complex patients with solid organ injuries
  - State the assignment of e-codes and significance
  - Discuss injury scaling and scores within trauma care systems
  - Describe basis for injury severity and scaling and respective scores
  - Identify various methods of data presentation
  - Explain AIS coding background and history
  - Identify areas related to DRGs to potentially increase financial reimbursement
  - Describe national initiatives currently in place and their importance to the National Trauma Data Bank (NTDB)
TRAUMA REGISTRAR
“Supporting Organizations”

- American Health Information Management Association (AHIMA)
- American Association of Professional Coders (AAPC)
Part 11

National Trauma Data Bank
&
Trauma Quality Improvement Program
NTDB -- The National Trauma Databank

The American College of Surgeons, Committee on Trauma (ACSCOT) developed a database known as the National Trauma Databank (NTDB) in the early 2000’s. This database was initially limited to the users of their trauma registry software TRACs. In the mid 2000’s, through a grant from the US Health Resources and Administrative Services (HRSA), the ACSCOT created an interface to accept data from other registry software and allowed other trauma centers to submit data free of charge. This enabled the ACSCOT to reach its goal of establishing a national trauma dataset that could be “used to inform the medical community, the public, and decision makers about a wide variety of issues that characterize the current state of the care of the injured persons”. MIEMSS left the decision to participate in the NTDB to each of the individual trauma centers. Individual trauma centers can request to participate through the following website: https://www.ntdbdatacenter.com/Default.aspx. Data are submitted in the spring of the year for the previous calendar year’s admissions. This timeline allows the trauma centers to ensure completeness of the data.

Data Dictionaries

The MIEMSS data dictionary has evolved over time. Because several states’ trauma centers participate in the NTDB data submission, it is imperative that the data elements contained in the MIEMSS trauma registry be mapped to the NTDB data dictionary. The NTDS (National Trauma Data Set) is a minimum dataset that the ACSCOT determined to be important to establish a national standard. Validation and mapping of variables between the MIEMSS dataset and the NTDB occurs on two levels, through the data dictionaries and then through the Collector software. Following the definitions in the dictionaries ensures the accuracy of the information, and the ability to compare across centers, both statewide and nationally. The NTDB data dictionary is updated every year by the ACSCOT and is available through the website: http://www.ntdb.org/.

NTDB Data Availability

This national dataset is available for research purposes and informational purposes by completing a request via the following website: http://www.facs.org/trauma/ntdb/ntdbapp.html. There is a fee associated with any dataset request and the amount is located on the website. Annual reports can be obtained without incurring a charge. Annual reports are available by calendar year. These are made available after the organization has received and compiled the data from the participating trauma centers. These reports are usually accessible in the fall of the year based on the previous calendar year’s data.
TQIP -- Trauma Quality Improvement Program

In 2007, the ACSCOT developed a new program called the Trauma Quality Improvement Program (TQIP). A pilot group of trauma centers participated in the development of a subset of NTDB data that would provide a means of tracking patient outcomes with the goal of improving patient care. This program was opened to additional level I and II trauma centers in 2009 and each trauma center’s participation is optional. There are additional fees for participation in the TQIP as well as a software license fee.

Components of the program include but are not limited to:

- Monthly educational sessions – surveys to assess participants knowledge of the NTDB data dictionary
- Quarterly data submission
- Quarterly web sessions to discuss data quality
- Semi-Annual reports – patient specific populations such as TBI, elderly, etc
- Annual meeting – centered around the mission of the TQIP group
  - Data quality
  - Data utilization
  - Patient outcomes

The website is:
http://www.facs.org/trauma/ntdb/tqip.html
APPENDICES
APPENDIX A

TRAUMA CENTER MODEL FOR QUALITY IMPROVEMENT DIAGRAM
APPENDIX B

QUALITY IMPROVEMENT AND PERFORMANCE IMPROVEMENT TERMINOLOGY DICTIONARY
APPENDIX D

TRAUMA REGISTRY
AND
COLLECTOR
APPENDIX G

TRAUMANET
APPENDIX I

INTERHOSPITAL TRANSFER GUIDELINES
APPENDIX K

MARYLAND EMERGENCY MEDICAL SERVICES
REFERENCE LIST
APPENDIX M

QUALITY MANAGEMENT: TOOLS & RESOURCES FOR EMS AND BASE STATIONS
APPENDIX N

MARYLAND MEDICAL PROTOCOLS