

Report to Governor Taft and the 125th General Assembly

# Seven Reports on EMS and Trauma Topics





Ohio Emergency  
Medical Services

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*This publication is a report by the State Board of Emergency Medical Services prepared by the staff of the Division of Emergency Medical Services, from research and information supplied by a number of organizations contracted with by the Division, and with assistance from members of the state Trauma Committee. This publication contains the recommendations of the State Board of Emergency Medical Services and summaries of the studies and research conducted on behalf of the Board and the Division.*

*The State Board of Emergency Medical Services authorized the state Trauma Committee and the Division of EMS staff to prepare this report pursuant to the mandate of Am. Sub. H.B. 138 of the 123<sup>rd</sup> General Assembly.*



# Executive Summary

The 123<sup>rd</sup> General Assembly, with the passage of Am. Sub. H. B. 138, tasked the State Board of Emergency Medical Services with producing seven reports on a variety of topics related to EMS and Trauma. The Division of EMS, serving as the administrative arm of the State EMS Board, contracted with seven groups to produce studies and /or research that would assist the EMS Board in responding to this mandate. The scope of the topics that the EMS Board was required to report on is very broad. In many instances the studies and research generated additional questions that need to be addressed. The EMS Board understands that, nationally, there continues to be a lack of quality research data in the published literature, upon which EMS practice can be improved. This situation is slowly improving, but remains a serious obstacle to EMS and Trauma System development. Secondly the EMS Board has discovered that in Ohio there appears to be a general lack of interest or ability on the part of EMS agencies, trauma centers and hospitals, and professional societies of healthcare providers to engage in large scale, meaningful EMS and trauma system research. This is a multifactorial problem, which is beyond the scope of this report to detail. The low level of interest in performing EMS specific research related to the reports required by the General Assembly was a considerable concern and this resulted in an important lack of data upon which to make recommendations.

**The EMS Board believes that all seven of these EMS/Trauma system reports would be better served with additional, more focused research and study.** Adequate funding for research of this nature and scope is essential. The Board further feels that a comprehensive EMS and Trauma research agenda will be of immense value. A comprehensive research agenda, that supports the national EMS research agenda, will permit appropriate state level facilitation of high quality research that can be used to support and improve EMS system development. It will allow for focusing of Ohio's limited EMS and Trauma research funding on priority research that is scientifically sound and builds upon the current body of knowledge in EMS. It will limit duplication of efforts and smaller scale research that could be more effectively coordinated as part of larger scientific efforts or clinical trials. It will permit Ohio to seek or participate in larger federal EMS and Trauma care grant opportunities, thus further expanding the research skills and experience within EMS in Ohio.

Among the significant findings of these reports, the EMS Board has found that there are ongoing needs in the areas of education, training and equipment for care of specialty populations that include but may not be limited to, pediatric and geriatric patients. Continual adaptation of advancing technology in data collection and reporting should be encouraged and supported. Improved communication between trauma surgeons and county coroners may lead to better utilization of autopsy data. There are ongoing needs for trauma specific continuing education for EMS providers and consideration should be given to expanding the type, nature and availability of that continuing education. Full development of a state wide EMS and Trauma system has been successfully undertaken in a number of states. Evaluation of the effects of these efforts on all participants, from first responders to rehabilitation providers, as well as continual evaluation of Ohio's system development, is crucial.

# Authority/Mandate

Am. Sub. H.B. 138  
Section 3.

The State Board of Emergency Medical Services, with the advice and assistance of its trauma committee, shall study and evaluate the following matters

- (A) The status and needs of emergency medical services and adult and pediatric trauma care provided between this state and other jurisdictions.
- (B) Methods to improve specialized care provided by emergency medical services organizations to pediatric and geriatric trauma victims.
- (C) The feasibility of recording and reporting information to the state trauma registry by means of portable electronic devices, such as electronic notepads. The study shall include an analysis of the cost of acquiring, maintaining, and using such devices, potential sources of funding, and training required to ensure effective use of the devices.
- (D) Methods to ensure that autopsies are performed on appropriate trauma victims and autopsy data are reported to the state trauma registry in a timely manner;
- (E) Methods to increase advanced trauma life support, basic trauma life support, and prehospital trauma life support training among appropriate health care providers, particularly in rural areas of the state.
- (F) The roles hospitals that are not trauma centers play in the state trauma system and regional trauma systems in this state, and methods to enhance those roles.
- (G) The causes and impact of trauma on minority populations in this state and methods to improve emergency medical services and trauma care for those populations. This study shall be conducted in cooperation with the Commission on Minority Health;

In conducting its studies and developing its findings and recommendations, the Board shall consult the appropriate committees and subcommittees of the Board; regional directors; regional physician advisory boards; organizations that represent physicians, nurses, and hospitals that care for emergency and trauma patients; emergency medical services organizations; appropriate governmental entities; and the Ohio State Coroner's Association, as appropriate.

Not later than three years after the effective date of this act, the Board shall report its findings and recommendations to the Governor, the General Assembly, and other appropriate authorities and organizations.



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# Introduction

Passage of Am. Sub. H.B. 138 by the 123<sup>rd</sup> General Assembly required the State Board of Emergency Medical Services to create reports on seven EMS/Trauma topics. Shortly after the appointment of the Trauma Committee in November of 2000, the determination was made that the Division of EMS and the State Board of EMS did not have the internal resources or expertise to conduct the required studies. The Division of EMS and the State Board of EMS agreed that under the direction of the Trauma Committee, individuals and or organizations with the appropriate expertise and resources would be contracted with to conduct the studies in preparation for the Board to submit a report to the Governor and General Assembly in November 2003. Initially the state supported university medical schools and their associated research departments were contacted and asked to submit quotes for performing one or more of the studies required by the legislation. After several months it was apparent that there was not sufficient interest from the medical schools. Only one organization was under contract with ODPS by the fall of 2001 for completion of one study looking at the role of non trauma center hospitals.

The studies required by the legislation were very broad and the amount of funding available to fund all seven studies was viewed to be minimal or inadequate by many of the potential researchers. A decision was made within the Division of EMS to invite a larger pool of organizations and/or individuals to participate by offering a grant for completion of supportive research projects or reports on topics related to the required reports. In most cases, researchers were asked to narrow the focus of their research or report. This was done to ensure that all of the required topics would be addressed and extrapolation of a more narrow report to a larger population or issue would be done when statistically appropriate and relevant. A call for proposals was made in January/February 2002. Proposals were received in March and six grants were awarded for completion of reports on six of the seven required topics, with one report being performed under a contract from the original request for quote process.

Based upon feedback from the organizations interested in assisting the Board complete these reports, reports on topics A and B were combined so that all pediatric issues were in one report, and all adult/geriatric issues were in another. The State Board of Emergency Medical Services, through the Division of EMS, awarded six grants and one contract, totaling \$563,044 to the following organizations to conduct research and/or develop the reports required for the Board.

- **Columbus Children’s Hospital (\$185,371)**  
Report A, the status and needs of emergency medical services and pediatric trauma care provided between this state and other jurisdictions and methods to improve specialized care to pediatric trauma victims.

- **Riverside Methodist Hospital, Senior Health Services (\$65,366)**  
 Report B, the status and needs of emergency medical services and adult trauma care provided between this state and other jurisdictions; and methods to improve care to geriatric trauma victims.
- **St. Vincent Mercy Medical Center (\$61,442)**  
 Report C, the feasibility of recording and reporting information to the state trauma registry by means of portable electronic devices, such as electronic notepads. The study shall include an analysis of the cost of acquiring, maintaining, and using such devices, potential sources of funding, and training required to ensure effective use of the devices.
- **Central Ohio Trauma System & Ohio State Coroner's Association (\$87,500)**  
 Report D, methods to ensure that autopsies are performed on appropriate trauma victims and autopsy data are reported to the state trauma registry in a timely manner.
- **Ohio Chapter, American College of Surgeons & Ohio Society of Trauma Nurse Coordinators (\$49,320)**  
 Report E, methods to increase advanced trauma life support, basic trauma life support, and prehospital trauma life support training among appropriate health care providers, particularly in rural areas of the state.
- **Hospital Council of Northwest Ohio (\$64,500)**  
 Report F, the roles hospitals that are not trauma centers play in the state trauma system and regional trauma systems in this state, and methods to enhance those roles.
- **Columbus Children's Hospital (\$49,545)**  
 Report G, the causes and impact of trauma on minority populations in this state and methods to improve emergency medical services and trauma care for those populations. This study shall be conducted in cooperation with the Commission on Minority Health.

Four of the seven organizations completed their projects under budget by a total of \$61,759.02. The total cost of grants and contracts to complete these studies was \$501, 284.98. This does not include ODPS, Division of EMS staff time.



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Six of the seven organizations completed their work on or before June 30, 2003. The seventh, Ohio Health, Senior Health Services, expects to have data collection completed and a report submitted by December 2003)

Given the very broad scope of these reports required by the legislation, the relatively short time frame for completion and minimal funding, it should be understood that these reports cannot be considered exhaustive, or comprehensive in nature. What is clear from the data in these studies is that additional research and study is required in all seven of these areas. The focus of future studies should be narrowed to address very specific issues, some of which can be extrapolated from data in these reports. A comprehensive and inclusive approach to evaluating and studying the EMS and Trauma system in Ohio is needed. An Ohio EMS and Trauma research agenda, supporting the national research agenda, is needed to ensure that the funding available in Ohio for EMS and Trauma research is utilized with maximum effectiveness to improve clinical care, support educational and injury prevention activities and support the needs for system development.

# Recommendations

- A. The status and needs of emergency medical services and pediatric trauma care provided between this state and other jurisdictions and methods to improve specialized care provided by emergency medical services organizations to pediatric trauma victims.**
1. Additional, focused studies on pediatric trauma care needs in our state EMS and Trauma System are needed.
  2. Mutual aid is not a concern; appropriate support between EMS provider agencies exists.
  3. EMS agencies require additional preparation (education, equipment, protocols/procedures) for children with special needs.
  4. The majority of EMS providers need more pediatric education, specifically in assessment, airway management and trauma management.
  5. There is a significant deficit of pediatric education and equipment, efforts to provide additional education and equipment need to be made.
  6. Medical Directors need to be more involved in EMS agencies requests for funding from the EMS/Trauma Grant program.
- B. The status and needs of emergency medical services and adult trauma care provided between this state and other jurisdictions and methods to improve specialized care provided by emergency medical services organizations to geriatric trauma victims.**
1. Additional, focused studies on adult trauma care needs in our state EMS and Trauma System are needed.
  2. Efforts should be made to support geriatric trauma research in areas of prehospital triage parameters and resuscitation.
- C. The feasibility of recording and reporting information to the state trauma registry by means of portable electronic devices, such as electronic notepads. The study shall include an analysis of the cost of acquiring, maintaining, and using such devices, potential sources of funding, and training required to ensure effective use of the devices.**
1. Additional, focused studies on electronic reporting of data to the state EMS and Trauma Registries are needed.
  2. Personal handheld devices, specifically the Palm Pilots tested, proved to be unfeasible for the collection of trauma registry data.
  3. Collection of registry data as directly as possible from the patient and family with concurrent entry into electronic format will have significant benefits both in cost savings and accuracy.
  4. Additional research into the use of wireless technology should be supported.



**D. Methods to ensure that autopsies are performed on appropriate trauma victims and autopsy data are reported to the state trauma registry in a timely manner.**

1. Additional, focused studies on the role of the county Coroner and data from autopsy reports to the state EMS and Trauma registries are needed.
2. The greatest barriers to performing autopsies on trauma victims are cost, family opposition, and lack of county coroner office staff.
3. Consensus needs to be developed between Ohio coroners and trauma medical directors on mechanism(s) of injury that require an autopsy.
4. Trauma medical directors do utilize the results of autopsies on trauma victims. Mechanisms to ensure that this data is accessible need to be in place.
5. No mandate to perform autopsies on trauma victims should be made without also providing for adequate financial and human resources for the county coroners, medical examiners or agencies/organizations performing the autopsies.
6. A single form (i.e. the death certificate) should be used statewide to report all required information as opposed to the creation of a special form just for injury reporting.
7. Autopsy reports should utilize a standardized format.
8. Efforts to promote complete documentation on the death certificate should be made.
9. The death certificate should include a field(s) to record the E codes (External Cause of Injury Code).
10. Resources need to be provided to county coroners to enable them to complete reports with tools that are designed to disseminate the information in an efficient and complete manner.

**E. Methods to increase advanced trauma life support, basic trauma life support, and prehospital trauma life support training among appropriate health care providers, particularly in rural areas of the state.**

1. Additional, focused studies on trauma education in Ohio are needed.
2. Exploring new options in education using existing technologies could improve accessibility and variety of courses, as well as resolve location issues.
3. On-line training, interactive educational software, and long distance education are options that should be evaluated for enhancement in learning opportunities.
4. Expanding trauma education programs beyond the basic level would be helpful in expanding continuing education options.

5. Statewide guidelines or standards for trauma education could also help identify the amount of trauma education needed.
6. Better communication about existing courses is needed to partially address issues with accessing courses.
7. Further study in the cost of education and investigating options for funding of trauma education is needed.

**F. The roles hospitals that are not trauma centers play in the state trauma system and regional trauma systems in this state, and methods to enhance those roles.**

1. Additional, focused studies on roles that all health care facilities play in the state EMS and Trauma System is needed.
2. The majority of hospitals, both trauma centers and non trauma centers, reported that they saw positive impacts, or reported no negative impacts, as a result of trauma system implementation. This should be monitored as the system matures.
3. Given that House Bill 138 has only been in operation since November of 2002, it was not possible to collect statistical data from the hospitals to determine what effects the trauma system changes have had on the non-trauma hospitals. A full year of data will be required to conduct the post-test and compare with the pre-test data collected during this project. Thus, a post-test should be conducted with Ohio hospitals in 2004 or 2005 to allow for at least a year's worth of experiences under the new trauma system guidelines. These data should be compared to the data collected through this project to determine the actual effect of House Bill 138 on the non-trauma centers.
4. For additional insight into the effects of House Bill 138, the State Trauma Committee believes the collection of objective data versus perception data would be more meaningful toward trauma system development.

**G. The causes and impact of trauma on minority populations in this state and methods to improve emergency medical services and trauma care for those populations. This study shall be conducted in cooperation with the Commission on Minority Health.**

1. Additional, focused studies on the impact of trauma on minority and specialty populations in Ohio are needed.
2. Information regarding race and ethnicity should be collected in such a manner as to be consistent and comparable between data sets such as the U.S. Census, the Ohio Bureau of Vital Statistics Death Certificate, the Ohio Trauma Registry and the EMS Incident Reporting System.
3. There are significant injury patterns, and causes specific to children in



- minority populations. Additional research and increased efforts in injury prevention programming are needed.
4. Access to EMS by minority populations does not appear to be a problem, however additional research of this may be needed to assure that minority populations have ready access EMS in all areas of Ohio.

### **Trauma Committee Review of the Studies and Research**

#### ***Trauma Committee Review of Special Study for Report A: “Identification of Issues Related to the Care and Management of Pediatric Trauma Patients Located Along the Border of Ohio”***

##### General Description/Stated Goals:

This study focuses on the identification of issues related to the care and management of pediatric trauma patients located within 20 miles of the Ohio-West Virginia border within HSA regions 5 & 6. EMS Medical Directors, air medical physicians, EMS coordinators, and EMS providers were surveyed with regard to mutual aid concerns, transport of pediatric patients across state borders, availability of pediatric education and equipment, as well as availability of pediatric resources such as pediatric policies, protocols, and medications. Pediatric run reports from the study area were also reviewed.

##### Key findings:

1. Thirty two percent of EMS providers had taken a pediatric specific training course.
2. Only twelve and one half percent of agencies have all of the state recommended BLS equipment.
3. Eleven percent of the agencies surveyed are missing appropriate pediatric sized bag-valve-masks.
4. Seventy five percent of ALS units have transport monitors and even less had pediatric electrodes and defibrillator capability.
5. Fifty three percent of EMS agencies had pediatric length/weight dose charts and only seventy-six percent had resuscitation drugs and IV fluids.
6. Forty one percent of EMS coordinators indicated the need for pediatric specific equipment.
7. Ninety six percent of EMS coordinators indicated the need for more pediatric training but find cost and travel prohibitive.

8. Ninety two percent of EMS coordinators would be interested in applying for grant funding to obtain pediatric equipment and training.
9. Eighty percent of the EMS coordinators did not have protocols for children with special needs.
10. The average transport time to the closest hospital was 25.4 minutes, however run report review identified average accumulated time for a pediatric transport was 58.7 minutes.
11. All of the physician responders identified pediatric education as critical. Money and distance were listed as barriers.
12. EMS medical directors responded that they wanted assistance with review of pediatric run reports and were unaware of pediatric resources currently available to their agencies.
13. Based on run report review, the use of mutual aid does not appear to be an issue for the study region.
14. In general, there were limited issues regarding the interstate transport of pediatric trauma patients. Ranked by frequency, EMS providers listed (1) no issues, (2) longer transport times, (3) concerns over medical/legal issues, (4) service area left uncovered, (5) discrepancies in standards of care between states, and (6) discrepancies in the qualifications of the responders between states.

#### Strengths:

1. There is an adequate literature review to ground the study.
2. The investigators contacted a large group of rural providers. They received very good response rates for the air medical directors, EMS medical directors and EMS coordinators. The EMS providers responded to a mailed survey at a rate to be expected using this method.
3. The study resulted in the clear identification of needs for the EMS system in southeast Ohio:
  - a. EMS training in pediatrics that is locally provided and inexpensive.
  - b. Pediatric equipment by the majority of BLS and ALS units.
  - c. Training and protocol development for children with special healthcare needs.
4. Usable data was obtained using a methodology that is easily replicable.

#### Weaknesses:

1. Readers must be careful not to generalize the study results to other border areas of Ohio.
2. The authors state that there are no published studies regarding transport of patients across state lines or on mutual aid agreements. They do comment that some of the transport times seem excessive. Benchmark data or guidelines should be provided for comparison to justify such observations.
3. There is no information indicating the EMS agencies surveyed have attempted to obtain funding for equipment or training from available grant programs.
4. The bar graphs used to illustrate the data in Section 8 are confusing. The authors should either re-design the graphs or provide directions as to how to read the graph.



Comment:

This is a nicely designed and reported study regarding the adequacy of resources to respond to pediatric emergencies along the southeast Ohio border. The authors identify several major areas of concern related to training, equipment, protocol development and case review. The study should be replicated in other regions to gain a more complete picture of pediatric trauma care within Ohio. At a minimum, the authors indicate a need to facilitate resources for this area of the state. In a big picture sense, this report indicates a strong need for data driven trauma program improvement throughout the state.

***Trauma Committee Review of Special Study for Report B:  
“Stand Up For Senior Independence Research-Preliminary Data”***

General Description/Stated Goals:

This purpose of this study is to evaluate a program for decreasing falls in individuals over the age of sixty years. Study subjects are approached for enrollment if they experienced two falls in their home during a 30 day period. Local EMS providers, independent living housing workers, and health care providers identify potential study participants. Once enrolled, subjects are screened for risk factors linked with frailty and falling. Specific interventions were provided as necessary. The primary outcome was the number of falls post-intervention.

Key findings:

1. Issues related to the home environment, dementia, and nutrition were identified in study subjects.
2. Sixty-five percent of the patients enrolled experienced no falls 3 months after their intervention.

Strengths:

1. Reducing falls in older adults is a good goal.

Weaknesses:

1. Special Study # 3 is supposed to address the status and needs of emergency medical services and adult trauma care between this state and other jurisdictions, and methods to improve care to geriatric trauma victims. The study does not address this topic.

2. There is no needs assessment data to support the research.
3. There is a low enrollment rate for study subjects (40%).
4. There is a high drop-out rate for study subjects (30%).
5. There is no control group. How do the authors know that other forces did not account for the results they measured?
6. There is no consideration for other factors that may result in falls. This would include medications, neuromuscular dysfunction, vision impairment, mental retardation, etc.
7. There is conflicting data in the study. The authors state that “100% of the research subjects decreased their number of falls post intervention.” In one of the tables, however, 11% of the research subjects experienced three falls three months post-intervention.

***Trauma Committee Review of Special Study for Report C:  
“Ohio Department of Public Safety HB 138 Special Project #6 Final Report”***

General Description/Stated Goals:

The purpose of this project was to study the feasibility of recording and reporting information to the Ohio Trauma Registry with portable electronic devices. The authors installed and tested a single software application and began testing it in January 2003. This report summarizes their experience.

Key findings:

Numerous problems were encountered. Most of the difficulties were related to the limited data capacity of the device tested. After four months, the authors concluded that portable handheld devices were not appropriate for this purpose and that laptops afforded the best approach for collecting data in a cost efficient and accurate manner. Implementation and testing of a wireless laptop computer system for recording trauma registry information is ongoing.

Strengths:

1. There is an adequate literature review to support the study.
2. The study identifies important limitations to the product and software studied.

Weaknesses:

1. This study does not meaningfully address the intent of the trauma legislation:
  - a. There was no listing/review of what products were available from alternative vendors.



- b. The authors tested only one system prior to abandoning hand held technology. There is no mention of why this was done.
2. The conclusions are limited by the technology and software used. There should have been some consideration for other handheld systems.
3. The study did not address potential sources of funding or training requirements for such a system.
4. The financial report on page 9 is unclear. How do the bold-faced values on the first line (untitled) related to the “Total” line?
5. On page 15, a reference to “typographical errors” is made. The reviewers believe the authors are referring to transcription errors. Typographical errors can be made whether writing down the information or entering it into an electronic database.

Comment on Study Recommendations:

The authors state that additional research into the use of wireless laptop computers should be supported. The information in the report does not support the notion that handheld technology should be abandoned for the purpose of reporting to the Ohio Trauma Registry. The State Trauma Committee believes that research into the use of all wireless technology, including handheld units, should be supported.

***Trauma Committee Review of Special Study for Report D:  
“The Nature of Injury Related Autopsies in Ohio”***

General Description/Stated Goals:

The objectives of this study include:

1. Determine which injury types are appropriate for autopsy:
  - a. Determine rate of autopsy for these injury types.
  - b. Determine barriers to autopsy performance for these injury types.
2. To identify which stakeholders utilize autopsy data and for what purpose.
3. To survey the state county coroners, medical examiner, and a sampling of trauma medical directors for suggestions on how data might be submitted to the Ohio Trauma Registry.

These objectives were addressed through a review of death certificates from 1996-2001 and surveys sent to all Ohio coroners/medical examiner, coroners from neighboring states, and Ohio medical directors.

### Key findings:

1. Sixty percent of unintentional injury deaths have an autopsy.
2. Sixty percent of intentional self-injury deaths have an autopsy.
3. Ninety-eight percent of homicides have an autopsy.
4. Ohio coroners indicated that among patients deemed appropriate for autopsy, only two percent did not receive an autopsy because of a barrier:
  - a. Barriers included cost, family opposition, and personnel.
5. Ohio and non-Ohio coroners consider trauma medical directors and EMS professionals infrequent users of autopsy data.
6. Trauma medical directors consider themselves and EMS professionals frequent users of autopsy data.
7. Trauma medical directors believed an autopsy after a motor vehicle crash was substantially more important when compared to Ohio coroners.
8. Much of the injury data included in the death certificate is missing (e.g. 59% of ICD9-10 data).
9. Over the five year study period, 2,936 injury deaths were not reviewed by a coroner, according to Ohio Vital Statistics. The consensus of the Ohio State Coroner's Association is that coroners are currently not being notified in these cases.
10. Ohio coroners expressed non-support for the creation of a new form and process to report autopsy injury data to the Ohio Trauma Registry.
11. Forty percent of coroners usually or always prepare their reports on manual typewriters.
12. While the majority of Ohio coroners are not in favor of a standardized reporting format, the non-Ohio coroners and Ohio trauma medical directors find this a reasonable request.

### Strengths/Comment:

This is an extremely well done study that sends a simple message. There is a communication gap between coroners and trauma medical directors regarding the collection of autopsy data and how it is/should be utilized. Trauma medical directors want more autopsy information. Ohio coroners believe the information will serve no purpose and tax an already overburdened system. The solution is for the trauma care providers and coroners to outline a specific plan for the use of autopsy data. This would include when an autopsy is performed, what data is necessary to obtain and report, and how the data will be used to improve trauma care in the state. There should be a performance improvement process to insure appropriate deaths are being reported to the coroners and that appropriate information from autopsies is being reported. Another necessary step is to provide adequate funding and resources for obtaining autopsy information. Electronic reporting of autopsy information should be explored.



### Weaknesses:

1. There is no data that indicates how Ohio compares to other states with regard to autopsy reporting.
2. The study indicates that there is a place on the death certificate to indicate if a case was reviewed by a coroner. This is incorrect. The death certificate has a place to indicate if the case was reported to the coroner.

### ***Trauma Committee Review of Special Study for Report E: “HB 138 Special Projects #7: Evaluating Trauma Education”***

### General Description/Stated Goals:

The objectives of this study included:

1. Identify which trauma education courses are currently offered throughout Ohio.
2. To ascertain the number and size of the different trauma education courses offered in Ohio.
3. To determine what courses are most utilized by trauma care professionals.
4. To evaluate the barriers to offering trauma educational courses.

Surveys regarding accessibility, availability, barriers, and perceptions of trauma education in Ohio were developed and distributed to EMS providers, nurses, and physicians who care for trauma patients. Information regarding course offerings and other types of trauma education were collected from training centers and course coordinators. Perceptions regarding barriers to attending trauma education courses were also solicited at a state stakeholders meeting (EMS Board/Trauma Committee retreat). The data were categorized by population density, regions, and other factors.

### Key findings:

1. Seventy eight percent of surveyed EMS providers indicated attendance of at least one trauma course. BTLIS was the most common course (73%)
2. Sixty three percent of EMS providers indicated certification in at least one trauma course.
3. Forty two percent of EMS providers believe they are receiving the necessary education to provide quality trauma care.
4. Lack of financial support, frequency of courses, and having to take courses while off-duty were the most common barriers to trauma education (Urban EMS providers were more likely to attend a trauma course during normal working hours).

5. Sixty-seven percent of surveyed nurses indicated attendance of at least one trauma course. Sixty percent hold a course certification. The most common course attended was TNCC followed by BTLIS.
6. Nurses cite time off work, lack of financial support as the major barriers to attending trauma courses.
7. Seventy-five percent of physicians indicated completion of a trauma course. ATLS was the most common course attended. Time off work and frequency of courses were cited as the major barriers.
8. Perceptions regarding course availability did not seem to differ with regard to population density.

Strengths:

1. This was a large and difficult undertaking. The surveys addressed the objectives.
2. The literature review demonstrates that trauma education results in improved knowledge and skill level. There is also literature available which supports the need for continuing trauma education. A 1990 study showed that BTLIS skills deteriorate after approximately 18 months of initial training. (Prehospital and Disaster Medicine 5:137-144.)
3. There was an excellent distribution of EMS responses with regard to geography.
4. The recommendations could serve as a basis for more objective studies related to trauma education.

Weaknesses:

1. The results may be biased due to the low return rate (10%-25%) of surveys from EMS providers, nurses and physicians.
2. The survey format was necessary given the nature of the study. The value of this report is the issues it identifies. These issues will require more objective study (which the authors clearly point out). It must still be stated that the document is mostly comprised of perceptual data. Therefore the recommendations for increasing access to education are not evidence based.
3. There were no questions related to whether EMS agencies took advantage of existing programs for funding trauma education (i.e. the EMS Grants Program).
4. The document states that the ACSCOT developed the BTLIS course. BTLIS was developed by an independent group of EMS physicians under the guidance of John Campbell, MD.
5. The tables should have been better labeled.



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***Trauma Committee Review of Special Study for Report F:  
“The Roles of Hospitals That Are Not Trauma Centers In The State Of Ohio’s  
Trauma System”***

General Description/Stated Goals:

The goals of this project included:

1. Profiling existing Ohio non-trauma center resources in terms of emergency care, laboratory, blood bank, in-patient care, diagnostic capabilities, surgical intensive care, and rehabilitation.
2. Profiling existing geographical relationships between non-trauma centers and trauma centers.
3. Measuring the impact of state trauma triage protocols on non-trauma hospitals.
4. Determining the level of collaboration between current non-trauma hospitals and trauma center hospitals on issues regarding patient care and follow-up.

To accomplish these goals, statistical information from hospitals was collected. Fact sheets identifying the number of trauma centers, projected number of trauma centers, number of staffed beds, number of ED injury visits, number of OR cases, and number of trauma center transfers within individual regions and throughout the state were developed. Additionally, subjective observations regarding the effect of the trauma legislation were compiled.

Key findings:

1. Ninety-six percent of all hospitals consider themselves to be very or somewhat familiar with Ohio’s trauma system.
2. Ninety percent of all hospitals thought trauma related communications were timely, useful, and understandable.
3. Over two-thirds of the respondents said they need more information about the trauma system. At least forty percent of all hospitals wanted more information about trauma performance improvement, peer review, and hospital trauma protocols.
4. Forty-three percent of hospitals had problems implementing required trauma system elements.
5. Twelve percent of hospitals believe trauma system implementation had a negative effect on their community.
6. Non-trauma centers were more likely to report a negative impact of the trauma legislation when compared to trauma centers.

Strengths:

1. The response rate to the survey was excellent (100%).

2. The regional and state data sheets provide good baseline data with regard to number of trauma centers as well as emergency department, ICU, acute care and pediatric beds, and emergency department visits for injuries.
3. The authors correctly identify that performing the study 6 months after trauma system implementation is too short of a time span.
4. The report identifies areas for state educational initiatives regarding the state trauma system.
5. It may be useful to compare the perceptions identified in the study to more objective measures of the effect of the trauma legislation.

Weaknesses:

1. The study title misrepresents the content. There is no discussion of the “role” of acute care hospitals in the trauma system.
2. Most of the report contains opinions which are not supported by fact. For instance, opinions regarding the effect of the trauma legislation on quality of trauma care were presented without any supporting data for these opinions. This is true for both the positive and negative effects stated in the study.
3. The study included only hospitals. EMS organizations, public officials, and local citizens could have provided helpful perceptions regarding the role of the non-trauma hospital.
4. Data for number of operative cases, and number of acute care hospital patients transferred to a trauma center are not trauma specific.
5. The study would have better served trauma system development if it had asked the hospitals what indicators should be measured to evaluate the trauma system so that baseline data could be collected.
6. The authors recommend the study be repeated one year after trauma system implementation. The effects of the trauma system would be better measured by waiting at least two years after implementation.

Comment on Study Recommendations:

The authors recommend one-on-one interviews with a random selection of non-trauma hospital CEO's and Emergency Supervisors to further gauge the effect of the trauma legislation. The State Trauma Committee believes the collection of objective data would be more meaningful toward trauma system development.



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## *Trauma Committee Review of Special Study for Report G: “The Impact of Trauma on Minority Children”*

### General Description/Stated Goals:

The objectives of this study included:

1. Identify causes and outcomes of injuries among Ohio’s pediatric minority populations.
2. Identify rate of injury with regard to cause and outcome by location for each minority group.
3. Compare the rates of missing data across minority groups and location.
4. Compare the rates of patients discharged to rehabilitation facilities with an Injury Severity Score of > 16 across minority groups.
5. Compare the time from 911 call logged to arrival in the emergency department across minority groups. The times for Caucasian patients were used to determine if there were differences across racial groups.

These objectives were met by reviewing the records of children listed in the trauma registries of the regional pediatric trauma centers in Ohio. Patients were included in the final study group if they were less than 16 years of age, transported directly from the scene, and admitted to the hospital for the treatment of an injury (or died in the emergency department). Data from the US Census (2000) and Ohio Vital Statistics were also used in this evaluation.

### Key findings:

1. Year 2000 census data indicates that minorities accounted for sixteen percent of Ohioans less than 16 years of age. (African Americans-12.3%, Native Americans-0.1%, Asians, 0.3%, Hispanic-1.1%, and Other-2.2%)
2. There were 1900 injury deaths in children from 1996-2001. Twenty-seven percent were of them were among minority children.
3. Of the 6084 direct from the scene admissions to regional pediatric trauma centers from 1998-2001, thirty-four percent (2060) were among minorities. African Americans accounted for twenty-eight percent of the total admissions.
4. African Americans have the highest rate of death and injury per 100,000 children. The relative risk of African Americans to injury death and trauma admissions is two to three times as great as the Caucasian population. Hispanics are at equal risk when compared to whites. Native Americans are at a little less risk and Asians are at substantially less risk when compared to Caucasians.

5. Hospital length of stay for minorities was the same as for Caucasians.
6. Risk of injury admission relative to the white population was led by burns (6.6 times as likely as Caucasians), followed by pedestrian injuries, gunshot wounds, assaults, drowning, and crush injuries.
7. The pattern of suicide injuries suggests prevention interventions should begin around age 10.
8. There was no relationship between distance to an EMS agency and the proportion of minorities within a given census block. In urban areas most residents are within three miles of an EMS agency regardless of minority status.

Strengths/Comment:

1. The study should provide valuable information for directing targeted injury prevention initiatives across the state.
2. The study maximized the use of data available in Ohio. There was good explanation of the data including strengths and limitations.
3. The study presents a clear data-based observation of how injuries among minority children compare to those in the Caucasian population.

Weaknesses:

1. While not practical, the study would have potentially been strengthened if all injured children would have been included. (That is, not only admissions directly from the scene to a trauma center.) The result is an underreporting of minority groups who may live in more rural areas of the state.
2. The study report could be strengthened by a literature review of how injury rates and deaths have historically compared between different races/ethnicities.
3. The authors should have included recommendations for addressing the differences observed.

# Organizations

The following agencies and organizations were invited to review a preliminary copy of the studies and research conducted for this report and to provide feedback and comments to the Division of EMS for inclusion in the final publication of this report. Seven of these organizations requested copies of one or more of the research studies, however, none provided feedback or comments for inclusion in the final publication of this report.

Alliance of Ohio Trauma Registrars  
Association of Ohio Children's Hospitals\*  
Association of Ohio Health Commissioners  
Governors Council on People with Disabilities  
Health Forum of Ohio\*  
Northern Ohio Firefighters  
Ohio Ambulance and Medical Transportation Association  
Ohio Association of Critical Care Transport  
Ohio Association of Emergency Medical Services  
Ohio Association of Professional Firefighters  
Ohio Chapter of the American Academy of Pediatrics  
Ohio Chapter of the American College of Emergency Physicians\*  
Ohio Chapter of the American College of Surgeons\*  
Ohio Dental Association  
Ohio Emergency Medical Technician Instructor Association  
Ohio Fire Chiefs Association  
Ohio Hospital Association\*  
Ohio Instructor Coordinators Society\*  
Ohio Nurses Association  
Ohio Orthopedic Society  
Ohio Osteopathic Association  
Ohio Rehabilitation Association  
Ohio Society of Physical Medicine & Rehabilitation  
Ohio Society of Trauma Nurse Coordinators  
Ohio State Coroners Association  
Ohio State Council Emergency Nurses Association  
Ohio State Firefighters Association  
Ohio State Medical Association  
Ohio State Neurological Society  
Ohio Department of Health  
Ohio Rehabilitation Services Commission\*

\* Requested a copy of one or more reports

# Research Studies

Complete copies of the seven research studies performed in support of this report are available from the Department of Public Safety, Division of Emergency Medical Services. Copies may be obtained by sending a written request to

Ohio Public Safety  
Division of EMS, 1<sup>st</sup> Floor  
EMS/Trauma Special Reports  
1970 W. Broad St.  
Columbus, Ohio, 43223

Or via an e-mail request to [mglenn@dps.state.oh.us](mailto:mglenn@dps.state.oh.us).

Please include your name and a complete mailing address

Electronic Copies (PDF format) may be downloaded from the EMS website, under the Trauma link at [http://www.state.oh.us/odps/division/ems/ems\\_local/default.htm](http://www.state.oh.us/odps/division/ems/ems_local/default.htm)

