



OHIO TRAUMA

EDUCATION AND
CERTIFICATION

February 6, 2020



Ohio Trauma Education and Certification

This work was sponsored by Ohio Department of Public Safety Division of EMS.

The research was conducted by IEM, incorporating data collected from an online survey designed by IEM with input from Ohio Division of EMS and the Ohio Trauma Committee. An initial draft of this report was delivered on December 30, 2019. Comments on the draft report have been addressed in this updated final report.

IEM is a global consulting house for safety, security, strategic performance, and sustainability. We combine objective, scientific analysis with a broad spectrum of experience to provide practical, effective solutions for public and private sectors. IEM's publications do not necessarily reflect the opinions of its research clients and sponsors.


Did You Know?

The “Star of Life” has become synonymous with emergency medical care. The symbol can be seen on ambulances, emergency medical equipment, and patches worn by EMS providers. At the center of the six-pointed star, there is a snake wrapped around the Rod of Asclepius. In Greek mythology, Asclepius is the god of medicine and healing. The skin-shedding snake is a symbol of rebirth and renewal. The six branches of the star represent the main functions of EMS:



- Detection
- Reporting
- Response
- On Scene Care
- Care in Transit
- Transfer to Definitive Care

The Star of Life was registered as a certification mark with the Commission of Patents and Trademarks on February 1, 1977, by the National Highway Traffic Safety Administration.

 **IEM** is a registered trademark.

© Copyright 2019 IEM

IEM documents are protected under copyright law.

<http://www.iem.com>

(800) 977-8191

Executive Summary

Ohio has a history of pioneering innovations in the healthcare field, from the first known hospital-based ambulance service (1865) to the development of the Heartmobile (1969), a vehicle designed to provide the assets of a coronary care unit to the patient while en route to the hospital. Today, the focus is on *traumatic injury*, which continues to be the leading cause of death among children and young adults. In 2015, trauma injury accounted for 52.2% of deaths in people 1–44 years of age in the United States, and that percentage has not been lower than 46% in the past 10 years.

The goal of this research is to help Ohio Emergency Medical Services (EMS) and the Ohio Trauma Committee better understand the current state of trauma education and certification held by EMS, Nurses, and Physicians in Ohio; and identify gaps and barriers to trauma education to help develop strategies that strengthen trauma education and, in turn, the trauma system across the state. Research objectives for this report focus on the following:

- **Trauma-specific education and certification:**
 - Quantify trauma-specific training held by clinicians across the state.
 - Identify barriers to obtaining trauma-specific training.
- **Rural Trauma Team Development (RTTD) courses:**
 - Identify awareness of RTTD courses by clinicians and hospitals.
 - Identify barriers to RTTD courses.
- **Trauma-specific performance improvement (PI) activities:**
 - Determine how often PI activities are conducted.
 - Identify barriers to conducting PI activities.

A single online survey was designed to address these objectives and gather data from Clinicians who treat trauma patients and Education staff who are in charge of trauma education.

Results

Statistical analysis found no statistical differences in survey responses from the eight Regional Physician Advisory Board regions or between urban and rural counties.

Years of experience: The survey found that Clinical respondents had many years of experience in treating trauma patients, with 70%–88% of EMS, Nurses, and Physicians having more than 5 years of experience and 24%–55% having more than 20 years of experience.

Trauma Certification

The most common certifications taken by EMS staff are Basic Trauma Life Support (BTLS)/International Trauma Life Support (ITLS) (85% of the 614 survey respondents have taken the course) and Prehospital Trauma Life Support (PHTLS) (65% of respondents have taken the course). The top two certifications held by Nurses were Trauma Nursing Core Course (TNCC) (79% have taken) and BTLS/ITLS (35% have taken). Advanced Trauma Life Support (ATLS) and BTLS/ITLS certifications are the top two held by Physicians who responded to the survey (97% and 85% of Physicians had taken the courses, respectively).

Ohio Trauma Education and Certification

The top barriers to trauma education identified by EMS, Nurses, and Physicians were:

- Time off work to attend trauma courses;
- Frequency of trauma courses;
- Physicians often questioned the usefulness of trauma courses;
- Financial support for taking trauma courses, a barrier identified by EMS and Nurses; and
- Location of trauma courses, a barrier identified by all groups but having larger impact on EMS.

Other findings from Likert-scale questions were as follows:

- Nurses feel that attending trauma courses improves their job-advancement opportunities, but EMS and Physicians do not.
- Nurses do not feel that they receive all the trauma education that they need to provide quality trauma care.
- Physicians were more likely to use out-of-state resources for trauma continuing education (CE) courses.
 - Physicians with board certification involving surgery were more likely to use out-of-state resources for trauma-specific CE courses than their non-surgery counterparts.
 - Physicians with board certification involving pediatrics were less likely to use out-of-state resources for trauma-specific CE courses than Physicians with board certification that did not involve pediatrics.
- Between certifications, Clinicians identified that their institution/department provided exercises and training activities to maintain competencies, but Physicians were more likely to indicate that no activities were offered

Rural Trauma Team Development

The survey clearly demonstrated that the vast majority of Clinicians have never heard of RTTD courses (85%), and of those who had heard of it, only 38% indicated that they knew what the RTTD course covered.

Clinicians identified the following barriers to RTTD:

- Had not heard about the RTTD course
- Never saw an RTTD course offered
- Low availability and frequency of the RTTD course
- No time (8 hours) for the RTTD course

Education personnel identified the following barriers to RTTD:

- Lack of interest from employees
- No local course instructors available
- Cost of putting on an RTTD course
- Difficulty finding a facility willing to take an entire day for the course

Performance Improvement Activities

Education staff from 56 EMS agencies from 29 counties responded to the question about PI activities, and 89% indicated that their agency has a PI program, but only 51% stated that their agency has a formalized written process for its PI program. The vast majority (84%) of EMS agencies feel that PI activities improve their trauma-specific performance. The frequency of PI activities elicited a varied response. The most common response was that PI activities were conducted on a sporadic and unscheduled frequency (21%). Other responses included monthly (20%), every 3 months (14%), annually (11%), and every 6 months (9%).

EMS Education respondents identified the following barriers to conducting PI activities within their agency:

- Scheduling—i.e., getting staff together
- Cost of bringing staff together (overtime pay)
- Difficulty getting feedback from trauma centers on patient outcome
- Lack of interest from staff
- Lack of guidance on how to conduct PI activities

To corroborate the last barrier listed regarding the lack of guidance on PI activities, 86% of respondents agreed that it would be helpful to have more thorough guidance regarding the peer review and PI process. Furthermore, more than 80% of EMS and non-EMS Education staff agreed that “consistent state standards are required for trauma education.”

Discussion and Recommendations

While the survey found that Clinical respondents had many years of experience treating trauma patients, the low percentage of Clinical respondents with less than 5 years of experience could also indicate a potential shortage in new clinicians. **Additional research may be required to determine if there are fewer people entering the field of trauma care.** If this is the case, then there needs to be some consideration on how to attract new clinicians to Ohio.

Trauma Certification

While 71% of Nurses have held a certification in TNCC, the second highest certification ever held was BTLS/ITLS at only 29%, and other certifications were seldom taken. **The state should review trauma certifications that Nurses might take and determine if TNCC is the best option for Nurses or if other certifications should be more actively promoted.**

A similar scenario is observed with trauma certifications held by Physicians. Beyond ATLS and BTLS/ITLS, Physicians rarely take EAT, AAST, or ANTR (less than 10% have taken these courses). **The state should review the trauma certifications that Physicians take and determine if ATLS and BTLS/ITLS are the best option or if other certifications should be more actively promoted.** Open comments from the survey stated that much of the material taught in ATLS should be reviewed because evidence is lacking or out of date.

Ohio Trauma Education and Certification

The survey identified some concrete barriers to trauma education and certification. Some lessons learned and experiences from other states that could provide potential mitigation to these barriers are as follows:

- Encourage EMS agencies that have high-volume trauma calls to develop ride-along programs so rural EMS providers can gain exposure to trauma cases.
- Encourage Nurses and Physicians from rural or non-trauma hospitals to spend time in trauma hospitals to gain trauma experience.
- Schedule regular video trauma conferences (weekly or monthly) between trauma hospitals and rural and non-trauma hospitals to review and discuss trauma cases.
- Work with drug companies to sponsor conferences where the companies can market their products and take some of the financial burden off the state. These conferences can provide updates to current practices or simulation labs, especially to reach the rural areas and clinicians who are not typically exposed to trauma cases.
- Consider developing a plan to take ATLS training on the road to better reach the rural hospitals.
- Purchase TraumaMan training mannequins that are used in ATLS training to develop a loaner program. Minnesota did this and reduced the cost of providing ATLS training by approximately \$50,000 in 2008.
- Consider developing online trauma courses that can take the place of lectured classes. This solution may be a way to give flexibility to EMS, Nurses, and Physicians to complete trauma training on their own schedule. For states that choose to develop online courses, the cost is less than for paying an instructor to conduct a full training module.

Rural Trauma Team Development

The overall lack of knowledge about RTTD was evident in the survey responses. **These results suggest that a more-effective public outreach program is needed to educate Clinicians on the purpose and benefits of RTTD courses.** Currently, the course requires a full 8-hour day to complete. To reduce the time commitment, an initial online component might be developed to give the basic premise of the course and allow hospitals to identify core team members. This could shorten the duration of the in-person training. Alternatively, multiple facilities could take the course concurrently through the use of video conferencing with the instructor.

Minnesota examined a potential alternative for rural trauma education: Comprehensive Advanced Life Support (CALS). Minnesota recommended that Level 3 and 4 trauma hospitals in the state consider procuring the CALS 6-disc set of CDs that visually illustrates common skills performed in emergency situations for about \$150 and making these available to their providers. **It is recommended that Ohio Division of EMS and the Trauma Committee review the CALS course as a possibility for rural hospitals in Ohio and to examine the CALS CDs to determine if they might be beneficial to Ohio hospitals and clinicians.**

Performance Improvement Activities

Only half of the EMS agencies responded that they have written processes for their PI program. This provides an opportunity to help improve PI programs for many EMS agencies across the state. The survey clearly shows that most EMS staff (86%) would be happy to have more thorough guidance regarding the peer review and PI process. **It is recommended that Ohio Division of EMS and the Trauma Committee develop more detailed guidance for PI activities and provide the guidance to EMS and hospitals.**

Miscellaneous

Response and treatment: While trauma training is important, response to trauma cases is also critical. A potential solution for improving the outcome of trauma cases is *telemedicine* and the concept of *telepresence*. Telepresence involves smaller and more rural healthcare facilities having access to trauma physicians for initial evaluations until all aspects of care have been delivered to the patient. **Ohio Division of EMS and the Trauma Committee should explore the potential benefits of telepresence for Ohio.**

Advocates: Studies have found that, even after a trauma patient is admitted into a hospital, having a dedicated patient advocate helps provide continuity of care for the trauma patient. **Ohio Division of EMS and the Trauma Committee should explore the potential benefits of having trauma patient advocates.**

Trauma Education Website: Most state trauma program websites have education contents, but the information differs from state to state. Well-organized websites have updated information on conferences and seminars and information on courses hosted by hospitals and outside organizations for trauma practitioners. **Ohio Division of EMS should examine its current website and review other state websites (listed in Appendix E) to find some helpful best practices.**

This page intentionally left blank.

Table of Contents

Introduction	1
Research Objectives	2
Methodology	3
Results	4
Clinical Survey Responses	5
EMS Certifications.....	5
Nurse Certifications.....	6
Physician Certifications	6
Clinical Experience.....	7
Prehospital Clinicians.....	7
Hospital Clinicians.....	9
Barriers to Trauma Training and Certifications for Clinicians	11
Other Significant Survey Findings for Clinicians.....	12
Rural Trauma Team Development Responses.....	12
Barriers to RTTD	13
Performance Improvement Activities	13
Barriers to Conducting Performance Improvement Activities	14
Education Feedback	15
Trauma Courses Offered	15
Record Keeping	16
Barriers to Trauma Training and Certifications for Education Staff	16
Other Significant Survey Findings for Education Staff	17
Discussion and Recommendations.....	17
Gaps and Solutions	17
Years of Experience	17
Trauma Certification	18
Rural Trauma Team Development.....	20
Response and Treatment.....	20
Performance Improvement Activities	21
Education	22
EMS Triage	22
Website	23
Appendix A: Online Survey Questions.....	A-1
Appendix B: Online Survey Announcement.....	B-1
Appendix C: Regional Physician Advisory Board Regional Data	C-1
Appendix D: Washington Triage Procedure	D-1
Appendix E: State Trauma Program Websites	E-1

This page intentionally left blank.

Acronyms

AAST	American Association for Surgery of Trauma
ACEP	American College of Emergency Physicians
AEMT	Advanced Emergency Medical Technician
ANTR	Annual National Trauma Refresher Course
APRN	Advanced Practice Registered Nurse
ATCN	Advanced Trauma Care for Nurses
ATLS	Advanced Trauma Life Support
BTLS	Basic Trauma Life Support
CAAS	Commission on Accreditation of Ambulance Services
CAH	Critical Access Hospital
CALS	Comprehensive Advanced Life Support
CATN	Course in Advanced Trauma Nursing
CE	Continuing Education
CEU	Continuing Education Unit
CFAI	Commission on Fire Accreditation International
CME	Continuing Medical Education
CPSE	Center for Public Safety Excellence
EAT	Eastern Association for Trauma
ED	Emergency Department
EMR	Emergency Medical Responder
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
ITLS	International Trauma Life Support
LPN	Licensed Practical Nurse
PA	Physician Assistant
PHTLS	Prehospital Trauma Life Support
PI	Performance Improvement
QA	Quality Assurance
QI	Quality Improvement
RN	Registered Nurse
RPAB	Regional Physician Advisory Board
RTTD	Rural Trauma Team Development
STAC	State Trauma Advisory Council
TCAR	Trauma Care After Resuscitation
TNCC	Trauma Nursing Core Course

This page intentionally left blank.

Introduction

In 1966, the landmark publication *Accidental Death and Disability: The Neglected Disease of Modern Society* provided evidence that accidental injury was a growing problem in the United States whose aspects are similar to those of an infectious disease epidemic.¹ The paper found that many prehospital ambulance providers were not trained and not equipped to manage patients injured in motor vehicle accidents. Contributing to the problem is the fact that clinical response to seriously injured patients delivered to most acute care hospitals with emergency departments was ineffective. Due in part to this document, the Highway Safety Act of 1966 dictated that improvements to emergency medical services' (EMS) plans, equipment standards, educational requirements, and other aspects of providing medical care to trauma patients were to be implemented by the states. The Emergency Medical Services Systems Act of 1973 provided grants to states to improve EMS training, equipment, and research. Florida, Illinois, and Maryland seized the opportunity to use federal support to pioneer development of regional emergency services programs and the first trauma systems in the United States. These first systems included essential components such as designation of tertiary centers, training of prehospital providers, development of triage guidelines, and quality-assurance review of patient outcomes.

Traumatic injury continues to be the leading cause of death among children and young adults. Figure 1 summarizes the impact of trauma injury in the United States.² In 2015, approximately 86,000 deaths were caused by

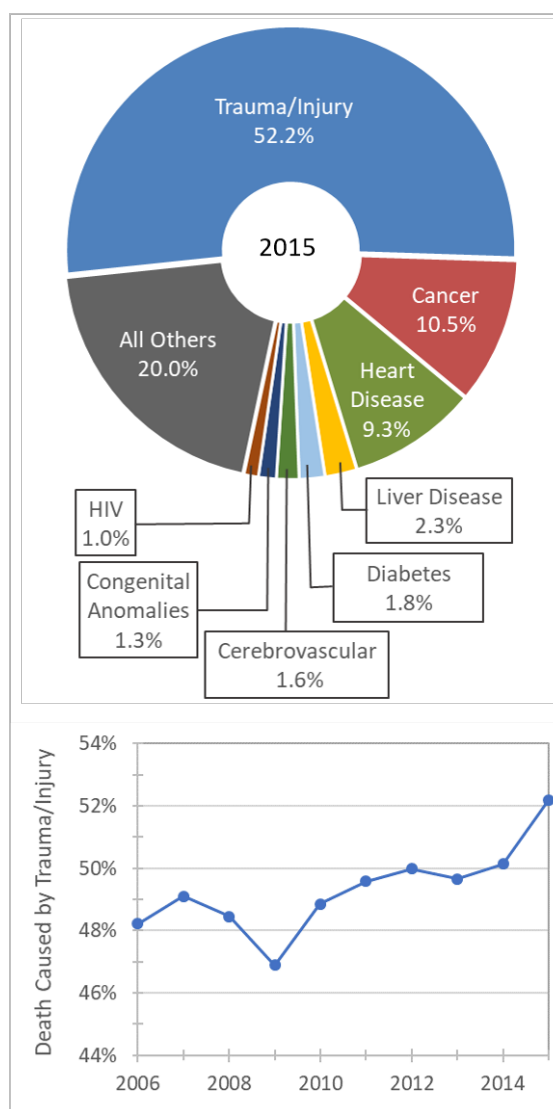


Figure 1: Leading Causes of Death and Trauma/Injury

¹ National Academy of Sciences. 1966. *Accidental Death and Disability: The Neglected Disease of Modern Society*. Accessed online December 16, 2019. <https://www.ems.gov/pdf/1997-Reproduction-AccidentalDeathDisability.pdf>

² Trauma injury includes "unintentional injury," "suicide," and "homicide" as classified in the Centers for Disease Control and Prevention's (CDC) Web-based Injury Statistics Query and Reporting System (WISQARS) tool. See: CDC. 2015. "Leading causes of death reports, national and regional, 1995–2015." Accessed online December 17, 2019. https://webappa.cdc.gov/sasweb/ncipc/leadcaus10_us.html

trauma injury in people 1–44 years of age. Trauma injury accounted for 52.2% of deaths in that age group, and that percentage has not been lower than 46% in the past 10 years.

Ohio's attempt to mitigate the impacts of trauma include the passage of House Bill 138 of the 123rd General Assembly in July 2000, which created the statewide trauma system. The bill included language on hospital trauma center requirements, patient triage, prehospital care, data collection, and trauma research and education. The rules dictating the care of trauma patients became effective in November 2002.

A goal of a trauma system is to get the right patient to the right place at the right time. In a more holistic view, trauma care extends to include events that occur before prehospital care and after hospital care. Figure 2 illustrates a trauma care survival chain that includes the first encounter of a trauma patient with a bystander prior to prehospital EMS care and includes the rehabilitation that allows for recovery and re-entry back into society. The survival chain could be extended further to include public education and injury-prevention programs. Added to this survival chain is a review cycle of Performance Improvement (PI)—a retrospective review of services or processes that is intended to identify problems and provide constructive feedback on quality improvements.

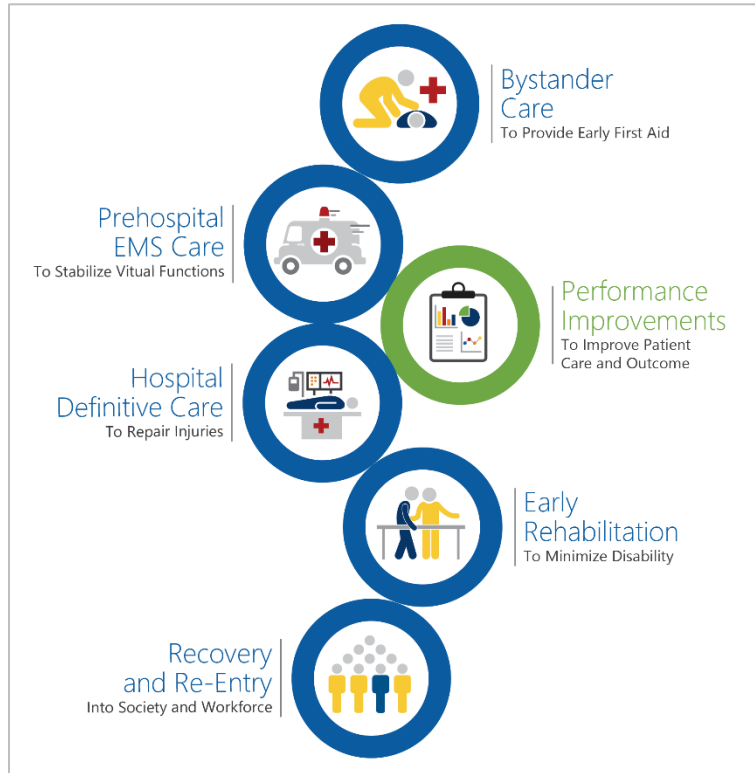


Figure 2: Trauma Care Survival Chain

Research Objectives

The goal of this research is to help the Division of EMS and the Ohio Trauma Committee better understand the current state of trauma education and certification held by EMS, Nurses, and Physicians in Ohio. Additionally, identification of gaps and barriers to trauma education can help in development of strategies to strengthen trauma education and, in turn, the trauma system across the state.

The research objectives for this report focus on the following:

- Trauma-specific education and certification:
 - Quantify trauma-specific training held by clinicians across the state.
 - Identify barriers to obtaining trauma-specific training.
- Rural Trauma Team Development (RTTD) courses:
 - Identify awareness of RTTD courses by clinicians and hospitals.
 - Identify barriers to RTTD courses.
- Trauma-specific PI activities:
 - Determine how often PI activities are conducted.
 - Identify barriers to conducting PI activities.

Methodology

A single online survey was designed to address the three main research objectives delineated above. Responses from people taking the survey determined the types of questions that appeared. IEM presented the initial survey design to the Trauma Committee and completed the survey design based on the Committee's input.

To begin the online survey, participants were asked to indicate whether their primary role was treating trauma patients (hereafter referred to as "Clinical") or if they were in charge of trauma education and/or certification (hereafter referred to as "Education"). For Clinical responses, the survey asked participants to indicate their primary role as either Physician (MD), Physician Assistant (PA), Nurse, or EMS. Each participants' response determined subsequent survey questions geared toward each of those roles.

To address the three main research objectives, the survey asks Clinical participants to indicate clinical trauma education taken and top barriers to trauma training and certification and answer questions pertaining to knowledge and opinions on RTTD courses. Survey participants in Education were queried on their PI activities as well as their experience with RTTD courses.

For a list of the online survey questions, see Appendix A.

An introductory email message was crafted with the assistance of the Division of EMS. On July 8, 2019, that email (Appendix B) with the link to the survey was sent out to the following:

- All current Ohio EMS providers (Emergency Medical Responders [EMR], Emergency Medical Technicians [EMT], Advanced EMTs [AEMT], and Paramedics)
- All members of the Ohio Trauma Committee, Ohio Trauma Registrars, and the Ohio Society of Trauma Nurse Leaders
- All Ohio regional trauma systems
- Regional healthcare coordinators through the Ohio Department of Health
- Ohio Regional Physicians Advisory Board

- Distribution through the Ohio American College of Emergency Physicians (ACEP)
- Ohio Fire Chiefs' Association

The online survey was also promoted the same week the survey email was sent out at the Ohio Fire and Rescue Officer Development Conference (July 11–15, 2019). Within the first week that the survey was active, there were approximately 500 responses, and roughly 75% of those responses came from EMS staff. On July 18, 2019, a second notice was released by the Division of EMS to encourage more survey participation from physicians and nurses. Originally, the survey was set to be closed on August 2, 2019, but the survey was kept open because of the low number of responses from physicians and nurses. Efforts to contact individual hospitals paid off as survey participation from hospital personnel increased from 25% to approximately 44% by the time the survey closed in October 2019.

Results

Survey responses are summarized in Table 1. A total of 1,358 responses were recorded, with 1,185 completed surveys (87% completion rate).

Table 1: Survey Responses

		Survey Responses	Completed Surveys
Clinicians	EMS	650 (56%)	578 (57%)
	Nurses	328 (28%)	276 (27%)
	Physicians	185 (16%)	159 (16%)
	Total	1,163	1,013
Education	EMS	57 (29%)	52 (30%)
	Non-EMS	138 (71%)	120 (70%)
	Total	195	172

Statistical analysis was conducted to determine if survey responses from different geographical regions or counties with different population densities were statistically different from other regions.³ The survey responses from the eight Regional Physician Advisory Board (RPAB) regions (Figure 3) were examined, but no statistical differences were found among the regions. Similarly, survey responses from urban and rural counties (as defined in the 2017 Ohio Trauma Registry Annual Report) did not differ statistically. In the remainder of this report, statewide response numbers are presented and discussed. Response numbers broken down by each of the RPAB regions are provided in Appendix C.

³ A Chi-square test was used to determine differences between the expected frequencies and the observed frequencies in the survey results. A p-value of 0.01 was used to detect statistical differences.



Figure 3: Regional Physician Advisory Board Regions

Clinical Survey Responses

A total of 1,163 survey participants identified themselves as clinicians whose primary role is to treat trauma patients. Survey response came from all counties that have hospitals. Of the clinical respondents, EMS staff accounted for 56% of clinicians, while Nurses and Physicians made up 28% and 16% of clinicians, respectively (Figure 4).⁴

EMS Certifications

The level of practice for EMS staff is shown in Figure 5. Most EMS staff hold the highest certification of Paramedic (65%), followed by EMTs (21%), AEMTs (11%), and EMRs (3%).

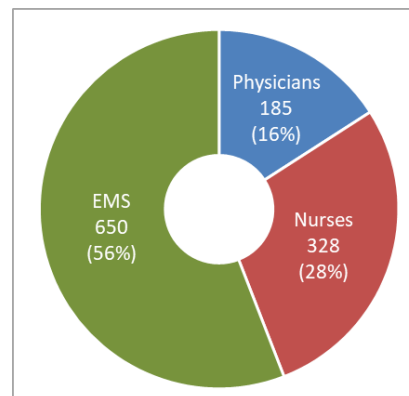


Figure 4: Clinical Respondents

⁴ Physicians consists of medical doctors (MDs) as well as physician assistants (PAs). In Figure 4, there are 180 MDs and 5 PAs.

Nurse Certifications

Nearly all Nurse respondents hold the certification of Registered Nurse (RN, 96%). Advanced Practice Registered Nurses (APRNs) made up 3% of Nurse responses, and Licensed Practical Nurses (LPNs) made up just 1% of Nurse responses (Figure 6).

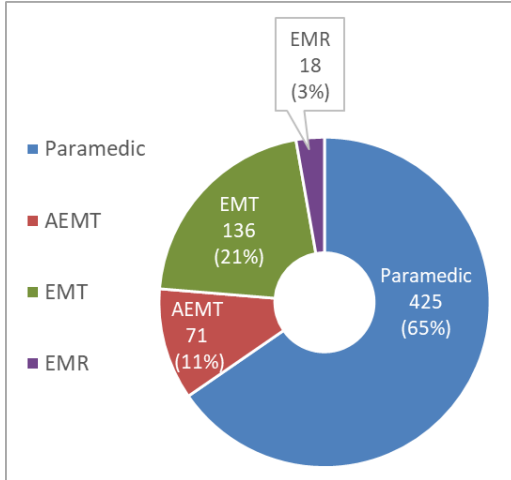


Figure 5: EMS Level of Practice

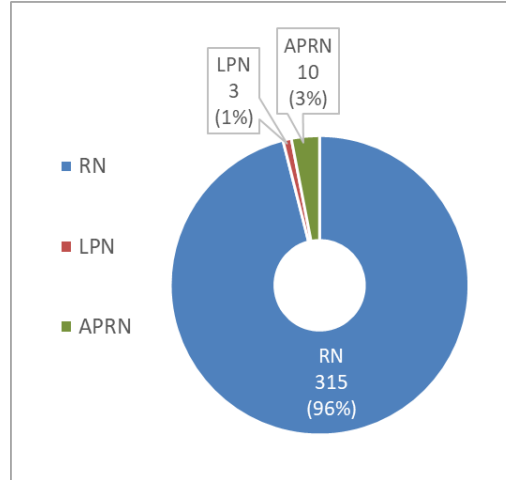


Figure 6: Nursing Level of Practice

Physician Certifications

Almost half of all Physician respondents are board certified in Emergency Medicine (52%). The next largest group were Physicians certified in Surgery (14%) and Pediatrics (11%), while the remainder of Physicians consisted of 5% or lower. Physicians in these smaller groups hold (in descending order) board certifications in Pediatric Emergency Medicine, Family Practice, Oral and Maxillofacial Surgery, EMS, Critical Care, Internal Medicine, Surgical Critical Care, Pediatric Surgery, and Radiology (Figure 7).

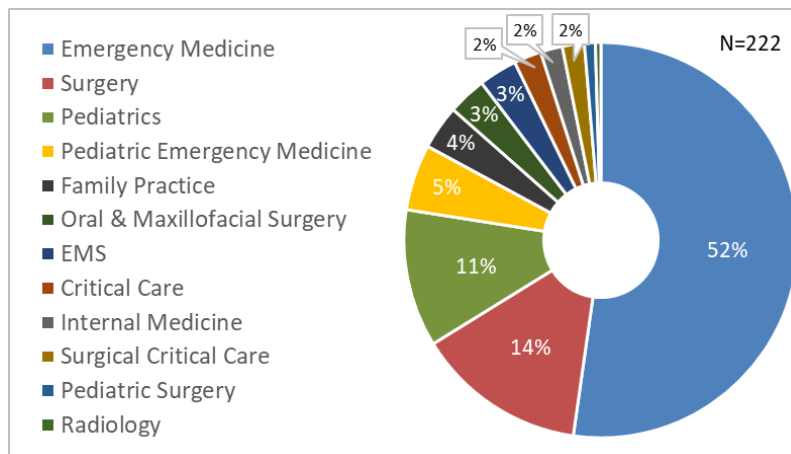


Figure 7: Physicians Board Certification

Clinical Experience

Clinicians were asked to provide their years of experience providing trauma care. Figure 8 shows that the most common response was more than 20 years of experience, with 24% of Nurses, 35% of Physicians, and 55% of EMS staff with the highest number of years of experience. Furthermore, at least 70% of all clinical survey respondents had more than 5 years of experience.

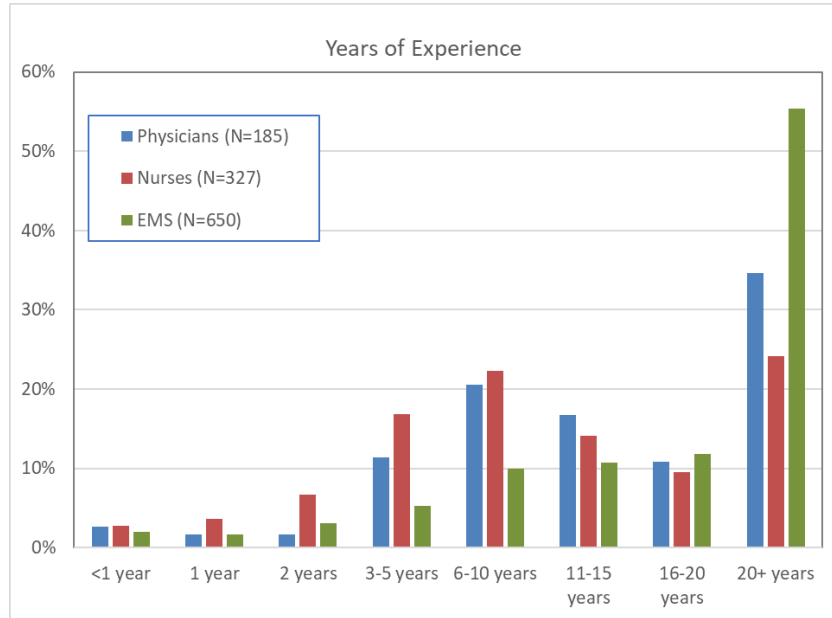


Figure 8: Clinician Experience

Prehospital Clinicians

Prehospital clinical survey respondents were stratified by EMS that provided ground or aviation transport and whether their agency was hospital-based or non-hospital-based. Survey responses indicated that approximately 2% of these EMS staff provided aviation transport, and the overwhelming majority of ground transport responses came from non-hospital-based EMS (86%) (Figure 9).

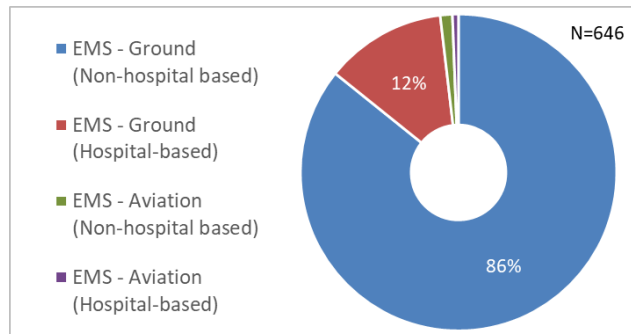


Figure 9: EMS Transportation Response Breakdown

Ohio Trauma Education and Certification

The worker composition of EMS staff in hospital-based and non-hospital-based agencies was examined in the survey. Both types of agencies use full-time, part-time, and volunteer (e.g., non-paid, nominally paid, or paid per call) EMS staff. Unsurprisingly, the survey had significantly more responses from volunteers in non-hospital-based EMS agencies in comparison to hospital-based EMS agencies (Figure 10).

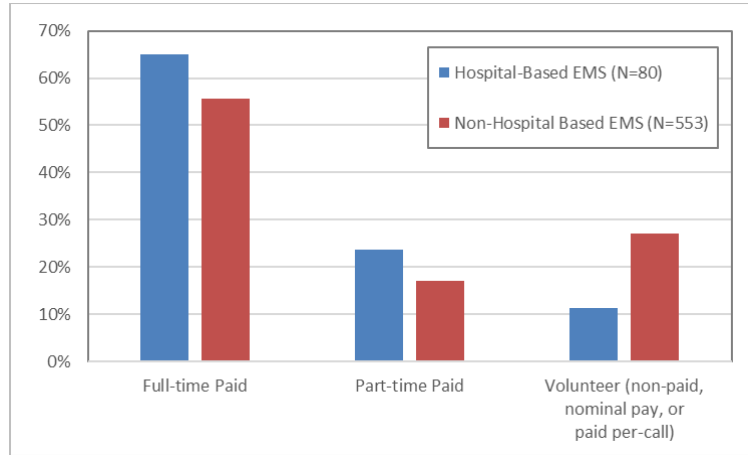


Figure 10: EMS Ground Employee Breakdown

EMS Trauma Certifications

To address the first research objective, survey participants were asked to indicate trauma-specific certifications they had taken and to identify if they were currently certified for each certification. Figure 11 shows the top two certifications held by EMS staff who responded to the survey. The most common certification taken by EMS staff is Basic Trauma Life Support (BTLS)/International Trauma Life Support (ITLS), with 85% of the 614 survey respondents having taken the course, and 68% had been certified at some time. At the time of the survey, 47% of people who had ever been certified are current with the BTLS/ITLS certification. EMS respondents identified Prehospital Trauma Life Support (PHTLS) as the second most common certification taken (65%). Approximately 52% of EMS respondents had been certified in PHTLS at some time, and 44% of those people were current on their certification.

Advanced Trauma Life Support (ATLS) has been taken by 49% of EMS respondents (N=612), and 36% have ever been certified. Approximately 32% of EMS respondents who have ever been certified are current on their ATLS certification.

Ohio Trauma Education and Certification

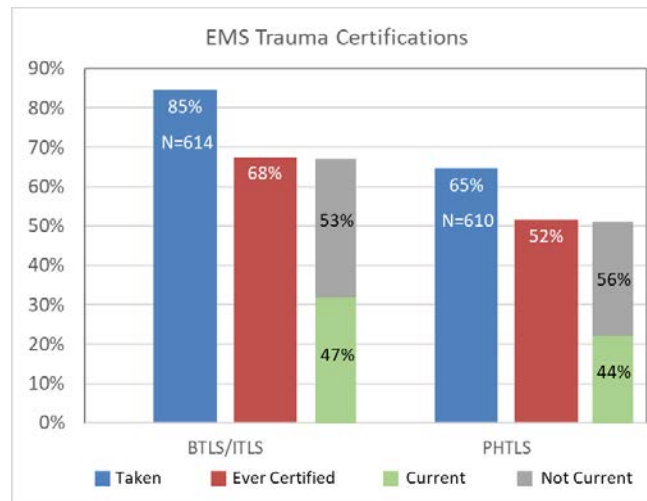


Figure 11: Top EMS Trauma Certifications

Hospital Clinicians

Physicians and Nurses were asked to identify the type of facility (trauma, non-trauma, etc.) where they work. Figure 12 shows the survey responses from Physicians and Nurses who work at Level 1, 2, and 3 trauma hospitals that treat adults; Level 1 and 2 trauma hospitals that treat pediatrics; freestanding emergency departments (EDs); critical access hospitals (CAHs); and non-trauma hospitals. The highest number of survey responses came from Physicians and Nurses who worked at Level 1 adult trauma hospitals and non-trauma hospitals, while the lowest number of survey responses came from Level 2 pediatric trauma hospitals and freestanding EDs.

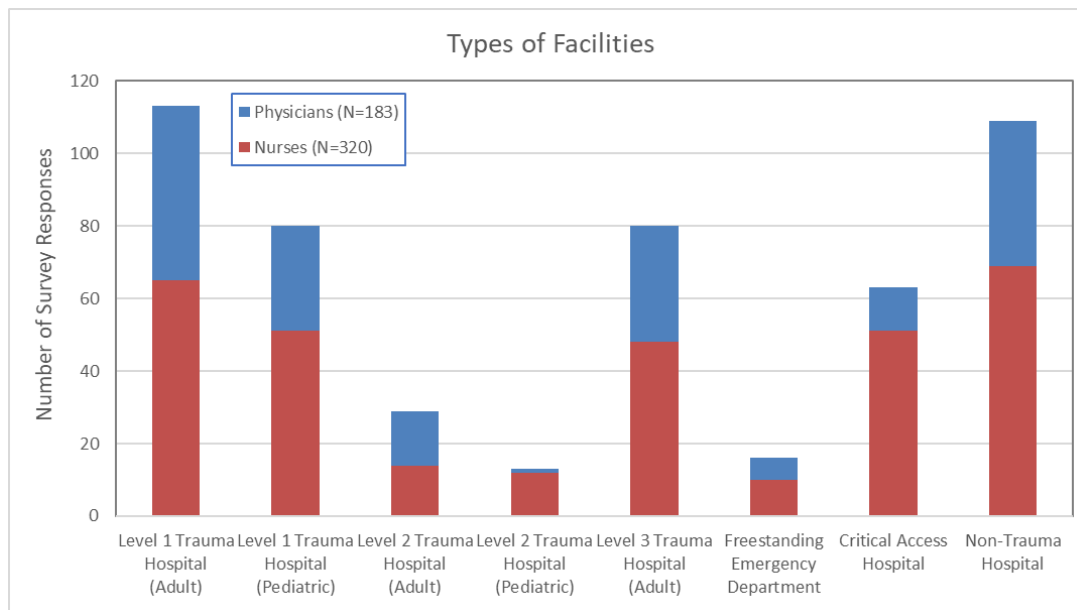


Figure 12: Physicians and Nurses in Different Types of Facilities

Nurses Trauma Certifications

The top two certifications held by Nurses who responded to the survey were Trauma Nursing Core Course (TNCC) and BTLS/ITLS (Figure 13). Of the 307 responses on the TNCC certification, 79% of Nurses had taken the course, and 71% of those people have ever been certified in TNCC. Of those who had ever been certified in TNCC, 85% are current with their TNCC certification. Nurse respondents identified BTLS/ITLS as the second most common certification taken (35%), and 52% had been certified in BTLS/ITLS at some time. Of those Nurses who had ever been certified in BTLS/ITLS, 44% are current on their BTLS/ITLS certification.

Other trauma-specific certifications taken by Nurses include ATLS (23%), PHTLS (16%), and Trauma Care After Resuscitation (TCAR) (10%). Certifications such as Course in Advanced Trauma Nursing (CATN) and Advanced Trauma Care for Nurses (ATCN) were taken by less than 10% of Nurses that responded to the survey.

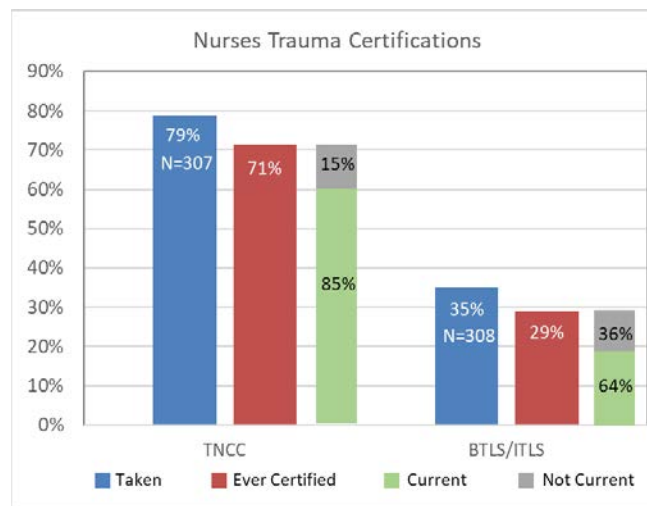


Figure 13: Top Nurses Trauma Certifications

Physicians Trauma Certifications

ATLS and BTLS/ITLS certifications are the top two held by Physicians who responded to the survey (Figure 14). Of the 181 responses on the ATLS certification, 97% of Physicians had taken the course, and 85% of respondents have ever been certified in ATLS. Of those who had ever been certified in ATLS, 60% of Physicians are current with their ATLS certification. The second most common certification taken by Physicians is BTLS/ITLS (52%), and 40% had been certified in BTLS/ITLS at some time. Of those Physicians who had ever been certified in BTLS/ITLS, 56% are current on their BTLS/ITLS certification.

Less popular trauma-specific certifications taken by Physicians include PHTLS (13%), Eastern Association for Trauma (8%), American Association for Surgery of Trauma (7%), and Annual National Trauma Refresher Course (3%).

Ohio Trauma Education and Certification

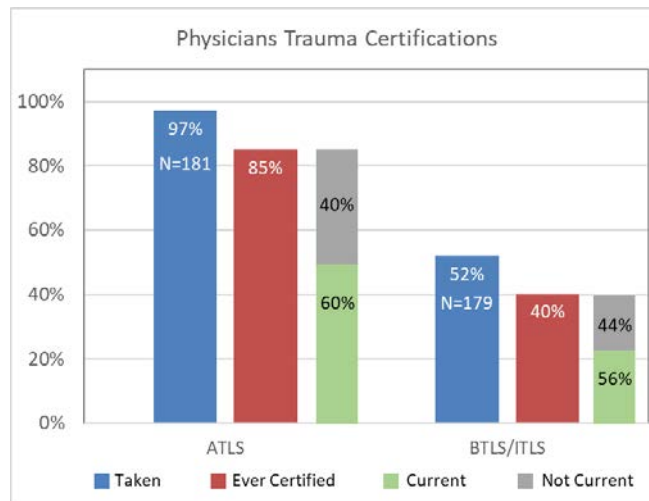


Figure 14: Top Physicians Trauma Certifications

Barriers to Trauma Training and Certifications for Clinicians

To identify gaps in trauma training and certification, clinicians were asked to specify their top barriers to trauma certification (Figure 15). The top barrier identified by EMS, Nurses, and Physicians was time off work to attend trauma courses. The second most commonly identified barrier was the frequency of trauma courses. Clinicians felt that the trauma courses they needed were not offered frequently enough. Frequency of the course was a larger barrier for EMS and Nurses than for Physicians. Physicians often questioned the usefulness of the trauma course. Some Physicians expressed this sentiment in open responses in the survey, stating that making Physicians take courses when they are board certified and actively practicing is unhelpful and a waste of time. Financial support for taking trauma courses was a barrier identified by EMS and Nurses. The location of trauma courses

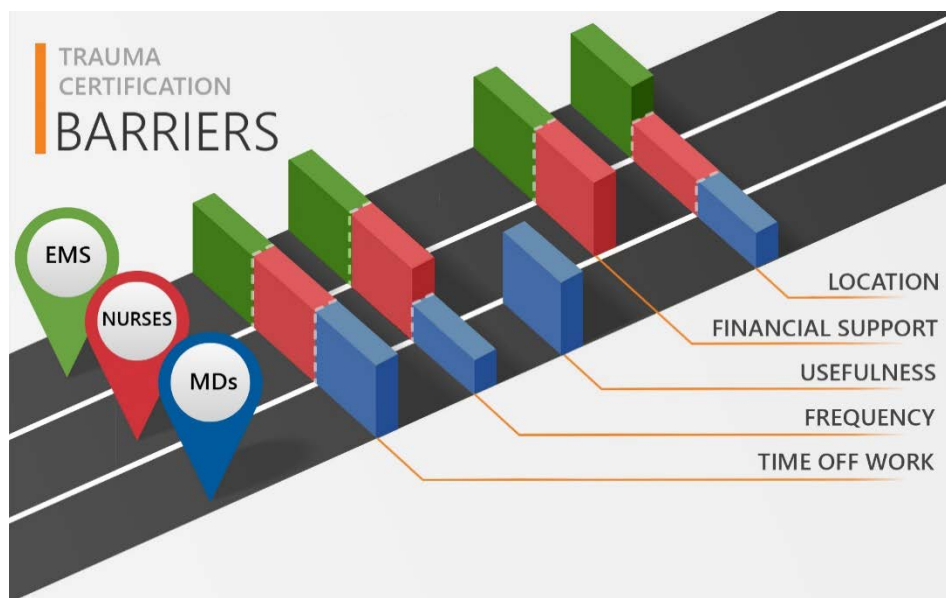


Figure 15: Top Trauma Certification Barriers for Clinicians

was identified as a barrier to all groups but is a larger impact on EMS.

Other Significant Survey Findings for Clinicians

In addition to identifying top barriers to trauma certification, survey respondents were asked a series of Likert-scale questions regarding trauma training and certification. The responses that were significantly different among EMS, Nurses, and Physicians are described below.

Approximately 57% of Nurses agreed or strongly agreed that attending trauma courses improves their job-advancement opportunities, while 40% and 33% of EMS and Physicians, respectively, agreed or strongly agreed to the question. Furthermore, Nurses do not feel that they are receiving all the trauma education that they need to provide quality trauma care; 39% of Nurses felt this way in comparison to 23% and 18% of EMS and Physicians, respectively.

Physicians identified the usefulness of trauma courses as a barrier to trauma certification, and that sentiment was reinforced when 39% of Physicians disagreed that they attended refresher courses to maintain their skills (as compared to 15% of EMS and 28% of Nurses). Further analysis of the question of usefulness of trauma courses for Physicians with different areas of board certification was conducted at the request of the Trauma Committee. There were no statistically significant differences on the sentiment of usefulness of the trauma course when the areas of board certification were broken down by surgical versus non-surgical certifications, and no significance was found when the areas of board certification were broken down by pediatric versus non-pediatric certifications.

The survey responses showed that Physicians were more likely to use out-of-state resources for trauma continuing education (CE) courses (54% of Physicians as compared to 25% of EMS and 20% of Nurses). Further analysis of this question for Physicians found some statistically significant difference due to board certification. Physicians with board certification involving surgery were more likely to use out-of-state resources for trauma-specific CE courses than their non-surgery counterparts. It was found that Physicians with board certification involving pediatrics were less likely to use out-of-state resources for trauma-specific CE courses than Physicians with board certification that did not involve pediatrics.

Between certifications, clinicians identified that their institution/department provided exercises and training activities to maintain competencies. Physicians, however, were more likely to indicate that no activities were offered—24% of Physicians in comparison to 9% of EMS and 14% of Nurses.

Rural Trauma Team Development Responses

A total 1,013 Clinicians were asked in the online survey if they had heard about the RTTD courses, and only approximately 15% (N=151) responded with a “Yes.” The response to the same question for Education respondents (N=176) who are in charge of trauma education/certification was significantly higher—39% said “Yes.” A breakdown of Education responses from respondents who worked in trauma hospitals (N=83) showed that they had heard of the RTTD courses in greater proportion (58%) than their counterparts in non-trauma hospitals (N=41) (20%) and in EMS agencies (N=52) (23%).

In the survey, only those who responded that they had heard of the RTTD courses were asked if they knew what the RTTD courses covered. A similar trend was observed for this follow-on question. Education respondents were significantly more likely to know what is covered in the RTTD courses (59%) as compared with Clinicians (38%). Again, Education respondents who worked in trauma hospitals were significantly more likely to know what is

covered in the RTTD courses (63%) as compared to their counterparts who worked in non-trauma hospitals (50%) and EMS agencies (50%).

Of the 151 Clinical survey responses that had heard of RTTD courses, only 8 (5%) responded that the RTTD course is offered at their facility/department, while 10 of 68 Education responses (15%) indicated that their facility/department offered the RTTD course. Those percentages increase to 23% and 29% of Clinical and Education responses, respectively, that the RTTD course was offered in their geographical area.

Despite the apparent lack of knowledge about the RTTD courses, Clinicians have high interest in attending an RTTD course. EMS and Nurses have an overwhelming interest in attending an RTTD course (89% and 76%, respectively), but Physicians show significantly lower interest (52%). Based on survey responses from Clinicians (N=1,092), only 4% have taken an RTTD course, and roughly half of those people have ever received an RTTD certification.

Barriers to RTTD

Both Clinicians and Education personnel responding to the survey identified barriers to the RTTD courses through open responses.

Clinicians identified the following barriers to RTTD:

- I haven't heard about the RTTD course.
- I have never seen an RTTD course offered.
- Low availability and frequency of the RTTD course.
- I don't have time (8 hours) for the RTTD course.

Education personnel identified the following barriers to RTTD:

- Lack of interest from employees
- No local course instructors available
- Cost of putting on an RTTD course
- Difficulty finding a facility willing to take an entire day for the course

Performance Improvement Activities

Education staff from 56 EMS agencies from 29 counties responded to the question about PI activities, and 89% indicated that their agency has a PI program. The agencies that claimed to have a PI program were asked to respond to additional questions in the survey. One question asked if the agency has a formalized written process for its PI program, and 25 of 49 respondents (51%) indicated that there is a formalized written process. Another question asked if the agency felt that PI activities improve their trauma-specific performance, and 41 of 49 respondents (84%) answered "Yes." The frequency of PI activities elicited a varied response (Figure 16). Out of 44 responses, the most common response was that PI activities were conducted on a sporadic and unscheduled frequency (21%). Other responses included monthly (20%), every 3 months (14%), annually (11%), and every 6 months (9%).

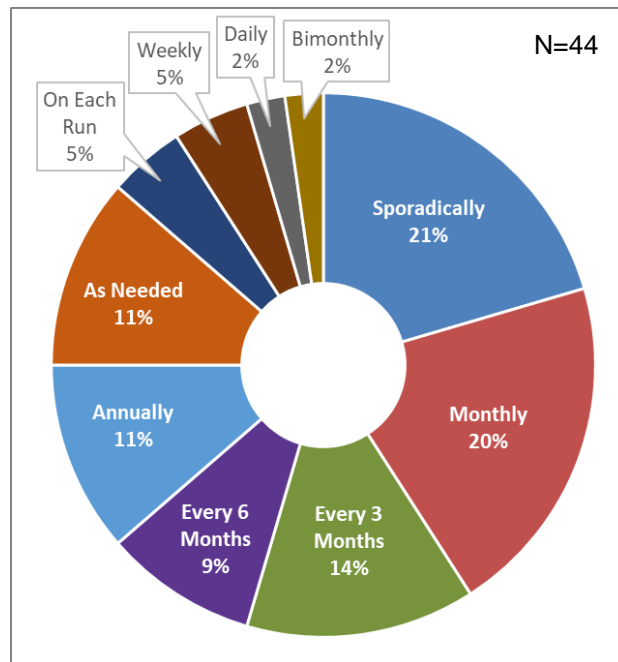


Figure 16: Frequency of Performance Improvement Activities

Barriers to Conducting Performance Improvement Activities

An open question to EMS Education respondents was offered to capture their impressions on barriers to conducting PI activities within their agency. Some common responses for barriers to conducting PI activities were:

- Scheduling—i.e., getting staff together;
- Cost of bringing staff together (overtime pay);
- Difficulty getting feedback form trauma centers on patient outcome;
- Lack of interest from staff; and
- Lack of guidance on how to conduct PI activities.

To corroborate the last barrier listed regarding the lack of guidance on PI activities, one survey question asked if it would be helpful to have more thorough guidance regarding the peer review and PI process, to which 42 of 49 people (86%) responded “Yes.”

Education Feedback

The survey was designed to capture input from both Clinicians who treat trauma patients and Education personnel who are in charge of trauma education and certification because these different groups have different perspectives on trauma care and education. The main rationale for receiving feedback from Education staff was to gain insight into PI activity carried out by EMS agencies, but the survey was able to capture other information that helps to improve understanding of trauma care in Ohio.

Trauma Courses Offered

Respondents were asked to indicate whether their agency/department offered specific trauma courses and how frequently those courses were offered. Table 2 shows the trauma courses offered by EMS agencies. The 2-hour Ohio trauma triage course is the most common course provided by EMS agencies, with 65% of agencies providing the course annually and 21% providing it periodically. The BTLS/ITLS course and the PHTLS course were offered at the same frequency—19% of agencies offered it annually, and 30% of agencies offered it periodically. The least common trauma course offered by EMS agencies is ATLS, with only 7% of agencies offering it annually and 19% of agencies offering it periodically.

Table 2: Trauma Courses Offered by EMS Agencies

Trauma Course	Certification Not Offered at My Agency/Service	Certification Offered Annually	Certification Offered Periodically
ATLS	42 (74%)	4 (7%)	11 (19%)
BTLS/ITLS	29 (51%)	11 (19%)	17 (30%)
PHTLS	29 (51%)	11 (19%)	17 (30%)
RTTD	54 (95%)	1 (2%)	2 (4%)
Ohio Trauma Triage	8 (14%)	37 (65%)	12 (21%)
Total	162	64	59

Education staff from non-EMS departments were asked about the frequency of trauma courses provided for Physicians and Nurses in their facilities (Table 3). The respondents indicated that TNCC was the most common course provided, with 52% of departments offering the course annually and 19% offering it periodically. The ATLS course, which is the most commonly held certification for Physicians, is the second most commonly offered course. Departments offer ATLS annually (35%) and periodically (15%). As shown in Table 3, other trauma courses are very infrequently offered (i.e., less than 60% of departments offer them). Some trauma courses (e.g., AAST, ANTR, ATCN, EAT) are offered by fewer than 80% of departments.

Table 3: Trauma Courses Offered by Non-EMS Agencies

Trauma Course	Certification Not Offered at My Agency/Service	Certification Offered Annually	Certification Offered Periodically
AAST	114 (86%)	13 (10%)	6 (5%)
ANTR	118 (89%)	7 (5%)	8 (6%)
ATCN	110 (83%)	11 (8%)	12 (9%)
ATLS	68 (50%)	47 (35%)	20 (15%)
BTLS/ITLS	82 (61%)	34 (25%)	18 (13%)
CATN	99 (74%)	16 (12%)	18 (14%)
EAT	123 (92%)	4 (3%)	7 (5%)
PHTLS	86 (64%)	25 (19%)	23 (17%)
RTTD	115 (86%)	5 (4%)	13 (10%)
TCAR	90 (67%)	20 (15%)	25 (19%)
TNCC	40 (30%)	70 (52%)	25 (19%)
Total	1,045	252	175

Record Keeping

Education personnel were asked to provide feedback regarding how their agency/department maintains their trauma-certification data. The responses from EMS and non-EMS staff were very similar with regard to these record keeping questions. The survey responses indicate the following⁵:

- 67%–68% of agencies/departments keep certification/training records on paper.
- 86%–88% of agencies/departments maintain certification/training records electronically.
- 88%–92% of agencies/departments track that all staff are up-to-date on certifications/training.
- 73%–78% of agencies/departments remind staff when they need to renew their certification/training.

Barriers to Trauma Training and Certifications for Education Staff

The top barriers identified by Clinicians were also observed in survey responses from Education respondents. The most frequently selected obstacle was taking time off from work to attend trauma-certification courses. As observed in Clinician responses, frequency of course offerings, financial support for taking courses, and location of courses were the other top barriers to trauma training and certification.

⁵ N=49 for EMS Education responses; N=127 for non-EMS Education responses.

Other Significant Survey Findings for Education Staff

Education staff were asked a series of Likert-scale questions regarding trauma training and certification. Approximately 67% of Education staff associated with EMS agencies agreed or strongly agreed that they had observed a lack of time for conducting trauma certification, while only 43% of Education staff at non-EMS agencies agreed or strongly agreed to that question.

Education staff were asked if they would like to see a minimum of 8 hours of trauma training and 2 hours of quality improvement process to be added as a requirement for trauma renewal; 71% of non-EMS Education staff agreed or strongly agreed to this question, but only 37% of EMS Education staff agreed or strongly agreed. One open response complained that EMS staff were required to receive much more trauma training than clinicians and that they did not want more repetitive training.

The highest level of agreement came when both EMS and non-EMS Education staff agreed or strongly agreed that “consistent state standards are required for trauma education” (91% and 81%, respectively). This response is in line with survey response where EMS Education staff agreed that it would be helpful to have more thorough guidance regarding the peer review and PI process. It appears that survey respondents would be happier if they had more consistent state standards for trauma education and the PI process.

Discussion and Recommendations

Ohio has a long history as a pioneer in the healthcare field. In 1865, the first known hospital-based ambulance service operated out of Commercial Hospital in Cincinnati (now Cincinnati General).⁶ In 1969, a mobile coronary care unit called the Heartmobile, based on a recreational vehicle platform, was developed and used in Columbus. Physicians and accompanying firefighters were dispatched in the Heartmobile to assist with the care of cardiac patients. The vehicle was designed to bring the care and facilities of a coronary care unit directly to patients, allowing them to receive treatment while en route to the hospital.⁷

Gaps and Solutions

The online survey and the research described in this report were designed to identify gaps and barriers to providing quality trauma care across the state with the hope of bridging those gaps and overcoming those barriers.

Years of Experience

The survey found that respondents had many years' experience treating trauma patients, with 70%–88% of EMS, Nurses, and Physicians having more than 5 years of experience and 24%–55% having more than 20 years of experience. The high level of experience of

⁶ Barkley, K. *The ambulance: The story of emergency transportation of sick and wounded through the centuries*. New York: Exposition Press. 1978.

⁷ Warren, J.V., F.M. Hill, and L. Faehnle. *The Columbus story of mobile emergency care*. Columbus, OH: Ohio State University College of Medicine. 1976.

respondents engenders confidence in the opinions expressed in the survey. Conversely, the low percentage of clinical respondents with less than 5 years of experience also suggests a potential shortage in new clinicians. **Additional research may be required to determine if there are fewer people entering the field of trauma care.** If this is the case, some consideration ought to be given to methods for attracting new clinicians to Ohio.

Trauma Certification

The survey identified BTLS/ITLS as the most commonly taken (85%) and held (68% ever certified) trauma certification by EMS respondents. TNCC was the most common certification for Nurses (79% taken and 71% ever certified), while Physicians were most likely to have certification in ATLS (97% taken and 85% ever certified). For EMS staff, the choices in trauma certification are small (ATLS, BTLS/ITLS, or PHTLS), and there is not great variation in the frequency that these trauma courses are taken by EMS. The case is quite different for Nurses and Physicians. In the survey, Nurses were asked to identify which trauma courses they had taken from a list of seven options, while Physicians had six options from which to choose.

While 71% of Nurses had ever held a certification in TNCC, the second highest certification ever held was BTLS/ITLS at only 29%, and other certifications were seldom taken. These results correlate very well with the frequency that Education staff indicated for the trauma certifications that their departments offered. **The state should review the trauma certifications that Nurses might take and determine if TNCC is the best option for Nurses or if other certifications should be more actively promoted.**

A similar scenario is observed with trauma certifications held by Physicians. Beyond ATLS and BTLS/ITLS, Physicians rarely take EAT, AAST, or ANTR (less than 10% have taken these courses). **The state should review trauma certifications that Physicians take and determine if ATLS and BTLS/ITLS are the best option or if other certifications should be more actively promoted.** Comments from the survey stated that much of the material taught in ATLS lacks evidence or is out of date. An editorial written by a British doctor stated, “When introduced almost 40 years ago, ATLS represented the cutting edge of trauma management; unfortunately, the course has failed to evolve at a pace that allows it to be relevant to the care delivered in modern medical trauma centers.”⁸

Barriers

Both Clinicians and Education staff clearly identify the top barriers to trauma certification are time off work to attend courses, financial support, location of courses, and frequency of courses. Now that these barriers have been identified, they can be addressed. Below, lessons learned and experience from other states are discussed to provide potential ways to mitigate these barriers.

One approach for trauma training and education involves clinicians learning about treatment of trauma through *first-hand experience*. In 2009, the Minnesota State Trauma Advisory Council (STAC) formed an Education Work Group to examine essential clinical skills as an

⁸ Wiles, M.D. 2015. “ATLS: Archaic Trauma Life Support?” *Anaesthesia* 70(8): 893–906.

element of the educational requirements of their trauma system.⁹ One of the Work Group's recommendations was to encourage EMS agencies with high-volume trauma calls to develop ride-along programs so rural EMS providers can gain exposure to trauma cases. A similar strategy can be applied to rural or non-trauma hospital staff to allow them to spend some time in trauma hospitals to gain some trauma experience.

Another way for trauma hospitals to share their experience with non-trauma hospitals is through *video conferencing*. This approach has been used by California¹⁰ and Minnesota. Regularly scheduled video trauma conferences (weekly or monthly) are set up so trauma cases can be reviewed and discussed.

In-person conferences can also be a way to disseminate trauma education. One study found that conferences are a way for drug companies to market their products for publicity, and the financial support of these companies helped to take some of the financial burden off the state to provide updates to current practices or to provide simulation labs.¹¹ Furthermore, these conferences can also be held in rural areas to reach some clinicians who are not typically exposed to trauma cases.

The Minnesota STAC also examined its trauma training and concluded that ATLS training across the state was too infrequent and difficult for rural providers to attend given the travel needed to attend the training. The STAC suggested that the state develop a plan to take ATLS training on the road to better reach the rural hospitals. Furthermore, the state purchased five TraumaMan training mannequins for use in ATLS training. A TraumaMan loaner program was developed to defer some of the training costs, and it was estimated that the loaner program reduced the cost of providing ATLS training by approximately \$50,000 in 2008.

Some states, such as Washington, have *online courses* that can take the place of lectured classes.¹² Didactic portions of the class are presented by trained paramedics and senior EMTs, and the hands-on skills have examinations that are scored, recorded, and filed. This solution may be a way to give flexibility to EMS, Nurses, and Physicians to complete trauma training on their own schedule. For states that choose to develop online courses, the cost is less than paying an instructor to conduct a full training module.

⁹ Minnesota Statewide Trauma System. 2009. "State Trauma Advisory Council Education Work Group Final Report."

¹⁰ State Trauma Advisory Committee. 2017. *California statewide trauma system planning: Recommendations of the State Trauma Advisory Committee*. Accessed online December 26, 2019. <https://emsa.ca.gov/wp-content/uploads/sites/71/2017/08/Statewide-Trauma-System-Planning20170509.pdf>

¹¹ Davis, D., et al. 1999. "Impact of formal continuing medical education: do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes?" *JAMA* 282 (9): 867–74 Accessed online December 24, 2019. <https://doi.org/10.1001/jama.282.9.867>

¹² Jerin, J.M., and T.D. Rea. 2005. "Web-based training for EMT continuing education." *Prehospital Emergency Care* 9(3): 333–37.

Rural Trauma Team Development

The survey clearly demonstrated that the vast majority of Clinicians had never heard of the RTTD course (85%), and, of those who had heard of it, only 38% indicated that they knew what the RTTD course covered. These results suggest that a more effective public outreach program is needed to educate Clinicians on the purpose and benefits of RTTD courses. One study documented that, following an RTTD course, the time from patient arrival to the decision to transfer to a trauma center was reduced by approximately 30 minutes.¹³

The main focus of the RTTD course is to assist healthcare professionals to determine the need to transfer patients to a higher level of care. The RTTD course is based on the concept that rural facilities can form a trauma team consisting of at least three core members to evaluate trauma patients at a rural facility.

Currently, the RTTD course requires a full 8-hour day to complete. To reduce the in-person course time commitment, **it is recommended that Ohio Division of EMS and the Trauma Committee consider an initial online component to present the basic premise of the course and allow hospitals to identify core trauma team members. An additional recommendation is for multiple facilities to take the RTTD course simultaneously through video conference with an instructor.**

The Minnesota STAC also examined RTTD courses and a potential alternative for rural trauma education: Comprehensive Advanced Life Support (CALS). CALS Rural Emergency Medical Education is a Minnesota-based 501(c)(3) nonprofit organization designed to address the educational needs of clinicians working in rural settings.¹⁴ The Minnesota STAC recommends that Level 3 and 4 trauma hospitals in the state consider procuring the CALS 6-disc set of CDs that visually illustrates common skills performed in emergency situations for about \$150 and making these available to providers. **It is recommended that Ohio Division of EMS and the Trauma Committee review the CALS course as a possibility for rural hospitals in Ohio and examine the CALS CDs to determine if they might be beneficial to Ohio hospitals and clinicians.**

Response and Treatment

While trauma training is important, the response to a trauma case is also critical. To improve the outcome of trauma cases, **one potential solution is telemedicine and the concept of telepresence.** Telepresence involves smaller and more-rural healthcare facilities having access to trauma physicians for the initial evaluation until all aspects of care have been delivered to the patient.¹⁵ In Arizona, they created a telemedicine system, and most of the consultations involved patients' dispositions. In 15% of all cases examined via telepresence, the trauma surgeon recommended keeping the patient at the referring facility. Other recommendations included skipping the computerized tomography (CT) scan and additional

¹³ Zhu, T., et al. 2016 "Effectiveness of the Rural Trauma Team Development Course for educating nurses and other health care providers at rural community hospitals." *Journal of Trauma Nursing* 23(1): 13–22. Accessed online December 26, 2019. <https://doi.org/10.1097/JTN.0000000000000176>.

¹⁴ For more information on CALS, see <https://www.calsprogram.org/> (accessed December 24, 2019).

¹⁵ Prabhakaran, K., G. Lombardo, and R. Latifi. 2016. "Telemedicine for trauma and emergency management: An overview." *Current Trauma Reports* 2(3): 115–23. Accessed online December 26, 2019. <https://doi.org/10.1007/s40719-016-0050-2>.

therapeutics such as placement of a nasogastric (NG) tube or transfusions of blood.¹⁶ Having an expert physician on standby helps treatment of the patient because the expert can judge whether the initial receiving hospital is capable of handling the case or whether transferring the patient to a trauma hospital is necessary. **It is recommended that the state do some research to determine if telepresence could be a useful tool to pursue.**

Studies have found that, even after a trauma patient is admitted into a hospital, having **dedicated patient advocates helps provide continuity of care for the trauma patient.** Having someone who can lead a response and specializes in trauma care helps trauma patient's chances after a severe injury. In Indiana, a Level 1 hospital tried using a trauma patient advocate to improve communication between the patient and the multiple teams to make sure that patients understood the options presented to them.¹⁷ Similarly, the "Medical Home" model is aimed at providing a single advocate, typically a trauma nurse, to improve the quality of pediatric trauma care.¹⁸

Performance Improvement Activities

Ohio Revised Code (ORC) 4765.12 states in part: "the state board of emergency medical, fire, and transportation services shall develop and distribute guidelines for the care of trauma victims by emergency medical service personnel and for the conduct of peer review and quality assurance programs by emergency medical service organizations." Additionally, ORC 4765-14-03 states in part: "EMS medical directors shall be responsible for enforcing state or regional trauma triage protocols for EMS personnel under their medical direction through a performance improvement or peer review process."

Based on survey responses, a high percentage of respondents (90%) stated that their agency had a PI program in place. Of those agencies that do have a program, only about half had a formalized written process for improving performance. These findings are promising from the standpoint that most agencies have the start of a PI program in place. Given that only half of the respondents have written processes offers an opportunity to help improve PI programs for many EMS agencies across the state. **The survey clearly showed that most EMS staff (86%) would be happy to have more thorough guidance regarding the peer review and PI process.**

Follow-up phone interviews were conducted with seven random EMS agencies in six of Ohio's eight districts inquiring about PI activities in their agency and within their region. Even though only one of the agencies contacted had a person dedicated specifically to EMS oversight, it was apparent that those agencies with a person dedicated specifically to EMS oversight (separate from the Medical Director) had a greater chance of having a more-thorough PI process in place. It was also noted that a formal written PI process was mandated for EMS agencies to be accredited. According to the Commission on Accreditation of Ambulance Services (CAAS), at the time of this report, only five EMS agencies are

¹⁶ Latifi, R., et al. 2007. "Telemedicine and telepresence for trauma and emergency care management." *Scandinavian Journal of Surgery* 96(4): 281–89. Accessed online December 3, 2019. <https://doi.org/10.1177/145749690709600404>.

¹⁷ Hartwell, J., et al. 2016. "A trauma patient advocate is a valuable addition to the multidisciplinary trauma team: A process improvement project." *The American Surgeon* 82(8): e183–85.

¹⁸ Rodriguez, K.A., C.J. Goodhue, and J.S. Upperman. 2010. "Pediatric nurse practitioner implementation of a pediatric trauma continuity clinic utilizing the 'medical home' model." *Journal of Trauma Nursing* 17(2): 64–66.

accredited in Ohio.¹⁹ Additionally, fire departments can be accredited through the Commission on Fire Accreditation International (CFAI), which requires written PI policies that could also benefit EMS operations. According to the Center for Public Safety Excellence (CPSE), at the time of this report, there are only 10 CFAI-accredited fire departments in Ohio.²⁰

The PI questions were only asked of those who listed Education as their primary role. This is a limitation of the survey, as only a small percentage of Ohio's EMS agencies were likely represented in the survey responses. This is because EMS agencies in Ohio that have the capacity to employ a full-time Education staff tend to be larger departments, so the survey responses may not have captured small and volunteer EMS departments.

Education

Education staff responding to the survey indicated that trauma courses offered by their agencies/departments are typically limited. For EMS agencies, BTLS/ITLS and PHTLS were not offered by approximately half of the agencies responding to the survey. Similarly, about half of non-EMS departments offered ATLS, the most common certification for Physicians. In the survey, most Education staff (84%) indicated that they would like more consistent state standards for trauma education. As recommended above in the Trauma Certification section, the state should review trauma certifications that EMS, Nurses, and Physicians might take and determine if some recommendations could be made on which certifications are more highly recommended than others. For example, TNCC had been taken by 79% of Nurses that responded to the survey, while ATCN, CATN, and TCAR were rarely taken by Nurses (10% or less). If the state reviewed trauma certifications for Nurses and recommended one or two courses over all the others, then hospitals could focus on providing only the recommended courses. The state does not need to restrict the trauma certifications that are offered but making strong recommendations can help hospitals and clinicians center their attention on a smaller set of certifications.

EMS Triage

The initial triage of injured patients by EMS is critical for assessing if the patient should be transported to a trauma hospital. The original Ohio EMS Guidelines and Procedures Manual was created in 1998, and there appear to be versions dated May 2013 and April 2018. The 2013 guideline is 31 pages in length,²¹ and the 2018 guideline grew to 209 pages.²² While the added detail in the 2018 guideline might provide additional details from its predecessor, a shorter decision-making version might be helpful. Washington State, for example, has a 2-

¹⁹ See: Commission on Accreditation of Ambulance Services. 2018. "Accredited agencies map." Accessed online December 26, 2019. <http://www.caas.org/accredited-agencies/accredited-agencies-map/>

²⁰ See: Center for Public Safety Excellence. "Accredited agencies." Accessed online December 26, 2019. <https://cpse.org/accreditation/accredited-agencies/>

²¹ Ohio Board of Emergency Medical, Fire, and Transportation Services. 2015 (rev.). *EMS guidelines and procedures manual for emergency medical responders*. Accessed online December 26, 2019. https://www.ems.ohio.gov/links/ems_Guidelines-Emergency-Medical-Responders.pdf

²² Ohio Board of Emergency Medical, Fire, and Transportation Services. 2018. *Emergency medical services adult guidelines and procedures manual*. Accessed online December 26, 2019. https://www.ems.ohio.gov/links/ems_Guidelines-Procedures-Manual.pdf

page triage guideline²³ (Appendix D); perhaps the Washington triage guideline could be used as a template for Ohio to develop a concise decision-making version.

It is not clear if EMS personnel in Ohio know about the most recent triage guidelines updated in 2018. Is it easy to find on the most up-to-date guidelines on the Ohio Division of EMS website? If reference resources are not easy to find or access online, then the website is not very useful for EMS responders.

Website

A review of all 50 states and their trauma program websites was conducted (see Appendix E). Iowa's website, for example, has a clean layout that allows a user to find important resources.²⁴ A clear bar on the left side of the screen organizes relevant information instead of hiding that information behind multiple tabs. The Virginia website has similar organizing tabs on the left side of the screen, but there is a tremendous amount of information that takes a lot of time and effort to negotiate.²⁵ Under the Iowa Trauma Resources, the first document is for Trauma Program Managers. It lays out expectations, different educational opportunities, and hospital verification processes in a single document. The Iowa website also includes a trauma facilities map that is geolocated.

The Minnesota Trauma Program website is an example of having too much information and not formatting it correctly.²⁶ The first page has a map of hospitals, but the user must scroll down the page, and the addresses of those hospitals are not provided. The address information can be found in the Trauma Registry, but it is provided as PDF files.

Most state trauma program websites have a page labelled "Education," but the contents of the information are different from state to state. Well-organized websites have updated information on conferences and seminars and information on courses hosted by hospitals and outside organizations for trauma practitioners. **It is recommended that Ohio Division of EMS examine its current website and review other state websites (Appendix E) to find some best practices that might be helpful.**

²³ Washington State Department of Health. 2012. "State of Washington prehospital trauma triage (destination) procedure." Accessed online December 24, 2019.

<https://www.doh.wa.gov/Portals/1/Documents/Pubs/530143.pdf>

²⁴ Iowa Department of Public Health. 2019. "Education, injury prevention, and outreach resources." Accessed online December 24, 2019. <https://idph.iowa.gov/BETS/Trauma/resources>

²⁵ Virginia Department of Health. 2019. "Virginia trauma centers." Accessed online December 24, 2019. <http://www.vdh.virginia.gov/emergency-medical-services/trauma-critical-care/virginia-trauma-centers/>

²⁶ Minnesota Department of Health. 2019. "Minnesota statewide trauma system." Accessed online December 24, 2019. <https://www.health.state.mn.us/facilities/traumasystem/>

Appendix A: Online Survey Questions

Clinical: Emergency Medical Services (EMS)

- Please indicate your current level of practice
 - Emergency Medical Responder (EMR)
 - Emergency Medical Technician (EMT)
 - Advanced Emergency Medical Technician (AEMT)
 - Paramedic
- Please indicate your years of experience
 - <1 year
 - 1 year
 - 2 years
 - 3–5 years
 - 6–10 years
 - 11–15 years
 - 16–20 years
 - 20+ years
- Please indicate your primary type of agency/service
 - EMS (hospital-based) ground
 - EMS (hospital-based) aviation
 - EMS (non-hospital based) ground
 - EMS (non-hospital based) aviation
- Please indicate the primary location of your institution (county)
 - Dropdown menu of all counties in Ohio
- What is the status of your primary position?
 - Full-time paid
 - Part-time paid
 - Volunteer (non-paid, nominal pay, or paid per-call)
- Clinical trauma education taken

Please indicate: Taken, Currently Certified, Previously Certified but not Current, Never Certified

 - ATLS

Ohio Trauma Education and Certification

- BTLS/ITLS
- PHTLS
- RTTD
- Ohio Trauma Triage Course (2 hours)
- Please indicate the number of trauma-specific CME/CEU/CE hours within the last 12 months, in addition to the courses above
- Clinical trauma education feedback

Please indicate your agreement with each of the following statements: Strongly Disagree, Disagree, Agree, Strongly Agree

 - My practice/hospital/department provides financial support for me to attend trauma courses
 - My hospital/institution makes me aware of trauma training that is available at my facility
 - Attending trauma courses improves my clinical trauma care abilities on the job
 - I attend trauma courses because they are required to keep my job
 - Attending trauma courses improves my advancement opportunities with my job
 - Trauma courses are offered on an annual basis
 - Trauma courses are held in locations that are easily and geographically accessible to me
 - Trauma courses are held at convenient times for me
 - I am required to attend trauma courses on my off-duty time rather than normal working hours
 - I have attended refresher courses to maintain my skills
 - It is difficult for me to fit trauma CME/CEU/CE in with all my other responsibilities
 - I have utilized in-state trauma CME/CEU/CE courses to maintain my skills
 - I have utilized out-of-state trauma CME/CEU/CE courses to maintain my skills
 - I am able to obtain state-required CME/CEU/CE hours within the geographical region I live
 - I am receiving all the continuing education I need to provide quality trauma care
- Between certifications, my institution/department provides these activities to maintain competencies
 - Exercise
 - Training
 - Nothing
 - Other: _____
- Please identify the top barriers to continuing trauma training and certification

You can select multiple options (**up to 3**)

Ohio Trauma Education and Certification

- Location of the course
- Frequency of the course offerings
- Time off from work to attend
- Financial support
- Administrative support
- Usefulness of the course
- Not required for my job
- Other: _____
- I have heard about the Rural Trauma Team Development (RTTD) courses
 - No
 - Yes
 - ♦ I know what is covered in RTTD courses
 - No
 - Yes
 - ♦ RTTD courses are offered by my facility/department
 - No
 - Unsure
 - Yes
 - ♦ RTTD courses are offered within my geographical area
 - No
 - Unsure
 - Yes
 - ♦ We are having trouble bringing an RTTD course to our facility/department
 - No
 - Unsure
 - Yes
 - ♦ I have an interest in attending an RTTD course
 - No
 - Unsure
 - Yes
 - ♦ I have attended an RTTD course
 - No
 - Unsure
 - Yes

- ♦ Open question: what barriers have you experienced with regard to RTTD courses?
- Do you have any additional comments or feedback?

Clinical: Nurse

- Please indicate your current level of practice
 - Registered Nurse (RN)
 - Licensed Practical Nurse (LPN)
 - Advanced Practice Registered Nurse (APRN)
- Please indicate your years of experience
 - <1 year
 - 1 year
 - 2 years
 - 3–5 years
 - 6–10 years
 - 11–15 years
 - 16–20 years
 - 20+ years
- Please indicate your primary type of institution
 - Level 1 trauma hospital (Adult)
 - Level 1 trauma hospital (Pediatric)
 - Level 2 trauma hospital (Adult)
 - Level 2 trauma hospital (Pediatric)
 - Level 3 trauma hospital (Adult)
 - Freestanding emergency department
 - Critical access hospital
 - Non-trauma hospital
- Please indicate the primary location of your institution (county)
 - Dropdown menu of all counties in Ohio
- What is the status of your primary position?
 - Full-time
 - Part-time
 - Per diem
- Clinical trauma education taken

Ohio Trauma Education and Certification

Please indicate: Taken, Currently Certified, Previously Certified but not Current, Never Certified

- ATCN
- ATLS
- BTLS/ITLS
- CATN
- PHTLS
- RTTD
- TCAR
- TNCC
- Please indicate the number of trauma-specific CME/CEU/CE hours within the last 12 months, in addition to the courses above
- Clinical trauma education feedback

Please indicate your agreement with each of the following statements: Strongly Disagree, Disagree, Agree, Strongly Agree

- My practice/hospital/department provides financial support for me to attend trauma courses
- My hospital/institution makes me aware of trauma training that is available at my facility
- Attending trauma courses improves my clinical trauma care abilities on the job
- I attend trauma courses because they are required to keep my job
- Attending trauma courses improves my advancement opportunities with my job
- Trauma courses are offered on an annual basis
- Trauma courses are held in locations that are easily and geographically accessible to me
- Trauma courses are held at convenient times for me
- I have an opportunity to attend other hospital-based education programs for contact hours (i.e., ED, OB, Critical Care, Med/Surg, Rehab)
- I am required to attend trauma courses on my off-duty time rather than normal working hours
- I have attended refresher courses to maintain my skills
- It is difficult for me to fit trauma CME/CEU/CE in with all my other responsibilities
- I have utilized in-state trauma CME/CEU/CE courses to maintain my skills
- I have utilized out-of-state trauma CME/CEU/CE courses to maintain my skills
- I am able to obtain state-required CME/CEU/CE hours within the geographical region I live
- I am receiving all the continuing education I need to provide quality trauma care

Ohio Trauma Education and Certification

- Between certifications, my institution/department provides these activities to maintain competencies
 - Exercise
 - Training
 - Nothing
 - Other: _____
- Please identify the top barriers to continuing trauma training and certification
You can select multiple options **(up to 3)**
 - Location of the course
 - Frequency of the course offerings
 - Time off from work to attend
 - Financial support
 - Administrative support
 - Usefulness of the course
 - Not required for my job
 - Other: _____
- I have heard about the Rural Trauma Team Development (RTTD) courses
 - No
 - Yes
 - ◆ I know what is covered in RTTD courses
 - No
 - Yes
 - ◆ RTTD courses are offered by my facility/department
 - No
 - Unsure
 - Yes
 - ◆ RTTD courses are offered within my geographical area
 - No
 - Unsure
 - Yes
 - ◆ We are having trouble bringing an RTTD course to our facility/department
 - No
 - Unsure
 - Yes
 - ◆ I have an interest in attending an RTTD course

- No
- Unsure
- Yes
- ♦ I have attended an RTTD course
 - No
 - Unsure
 - Yes
- ♦ Open question: what barriers have you experienced with regard to RTTD courses?
- Do you have any additional comments or feedback?

Clinical: Physician (MD)

- Please indicate all areas of board certification
 - Surgery
 - Emergency Medicine
 - Family Practice
 - Pediatrics
 - Other: _____
- Please indicate your years of experience
 - <1 year
 - 1 year
 - 2 years
 - 3–5 years
 - 6–10 years
 - 11–15 years
 - 16–20 years
 - 20+ years
- Please indicate your primary type of institution
 - Level 1 trauma hospital (Adult)
 - Level 1 trauma hospital (Pediatric)
 - Level 2 trauma hospital (Adult)
 - Level 2 trauma hospital (Pediatric)
 - Level 3 trauma hospital (Adult)
 - Freestanding emergency department
 - Critical access hospital

Ohio Trauma Education and Certification

- Non-trauma hospital
- Please indicate the primary location of your institution (county)
 - Dropdown menu of all counties in Ohio
- Clinical trauma education taken

Please indicate: Taken, Currently Certified, Previously Certified but not Current, Never Certified

 - ATLS
 - BTLS/ITLS
 - PHTLS
 - RTTD
 - Eastern Association of Trauma
 - American Association for Surgery of Trauma
 - Annual National Trauma Refresher Course
- Please indicate the number of trauma-specific CME/CEU/CE hours within the last 12 months, in addition to the courses above
- Clinical trauma education feedback

Please indicate your agreement with each of the following statements: Strongly Disagree, Disagree, Agree, Strongly Agree

 - My practice/hospital/department provides financial support for me to attend trauma courses
 - My hospital/institution makes me aware of trauma training that is available at my facility
 - Attending trauma courses improves my clinical trauma care abilities on the job
 - I attend trauma courses because they are required to keep my job
 - Attending trauma courses improves my advancement opportunities with my job
 - Trauma courses are offered on an annual basis
 - Trauma courses are held in locations that are easily and geographically accessible to me
 - Trauma courses are held at convenient times for me
 - I have attended refresher courses to maintain my skills
 - It is difficult for me to fit trauma CME/CEU/CE in with all my other responsibilities
 - I have utilized in-state trauma CME/CEU/CE courses to maintain my skills
 - I have utilized out-of-state trauma CME/CEU/CE courses to maintain my skills
 - I am able to obtain state-required CME/CEU/CE hours within the geographical region I live
 - I am receiving all the continuing education I need to provide quality trauma care

Ohio Trauma Education and Certification

- Between certifications, my institution/department provides these activities to maintain competencies
 - Exercise
 - Training
 - Nothing
 - Other: _____
- Please identify the top barriers to continuing trauma training and certification
You can select multiple options **(up to 3)**
 - Location of the course
 - Frequency of the course offerings
 - Time off from work to attend
 - Financial support
 - Administrative support
 - Usefulness of the course
 - Not required for my job
 - Other: _____
- I have heard about the Rural Trauma Team Development (RTTD) courses
 - No
 - Yes
 - ◆ I know what is covered in RTTD courses
 - No
 - Yes
 - ◆ RTTD courses are offered by my facility/department
 - No
 - Unsure
 - Yes
 - ◆ RTTD courses are offered within my geographical area
 - No
 - Unsure
 - Yes
 - ◆ We are having trouble bringing an RTTD course to our facility/department
 - No
 - Unsure
 - Yes
 - ◆ I have an interest in attending an RTTD course

- No
- Unsure
- Yes
- ♦ I have attended an RTTD course
 - No
 - Unsure
 - Yes
- ♦ Open question: what barriers have you experienced with regard to RTTD courses?
- Do you have any additional comments or feedback?

Clinical: Physician Assistant

- Please indicate all areas of certification
 - Critical Care
 - Emergency Medicine
 - Family Medicine
 - General Surgery/Trauma
 - Pediatrics
 - Other: _____
- Please indicate your years of experience
 - <1 year
 - 1 year
 - 2 years
 - 3–5 years
 - 6–10 years
 - 11–15 years
 - 16–20 years
 - 20+ years
- Please indicate your primary type of institution
 - Level 1 trauma hospital (Adult)
 - Level 1 trauma hospital (Pediatric)
 - Level 2 trauma hospital (Adult)
 - Level 2 trauma hospital (Pediatric)
 - Level 3 trauma hospital (Adult)
 - Freestanding emergency department

Ohio Trauma Education and Certification

- Critical access hospital
- Non-trauma hospital
- Please indicate the primary location of your institution (county)
 - Dropdown menu of all counties in Ohio
- Clinical trauma education taken

Please indicate: Taken, Currently Certified, Previously Certified but not Current, Never Certified

 - ATLS
 - BTLS/ITLS
 - PHTLS
 - RTTD
 - Eastern Association of Trauma
 - American Association for Surgery of Trauma
 - Annual National Trauma Refresher Course
- Please indicate the number of trauma-specific CME/CEU/CE hours within the last 12 months, in addition to the courses above
- Clinical trauma education feedback

Please indicate your agreement with each of the following statements: Strongly Disagree, Disagree, Agree, Strongly Agree

 - My practice/hospital/department provides financial support for me to attend trauma courses
 - My hospital/institution makes me aware of trauma training that is available at my facility
 - Attending trauma courses improves my clinical trauma care abilities on the job
 - I attend trauma courses because they are required to keep my job
 - Attending trauma courses improves my advancement opportunities with my job
 - Trauma courses are offered on an annual basis
 - Trauma courses are held in locations that are easily and geographically accessible to me
 - Trauma courses are held at convenient times for me
 - I have attended refresher courses to maintain my skills
 - It is difficult for me to fit trauma CME/CEU/CE in with all my other responsibilities
 - I have utilized in-state trauma CME/CEU/CE courses to maintain my skills
 - I have utilized out-of-state trauma CME/CEU/CE courses to maintain my skills
 - I am able to obtain state-required CME/CEU/CE hours within the geographical region I live
 - I am receiving all the continuing education I need to provide quality trauma care

Ohio Trauma Education and Certification

- Between certifications, my institution/department provides these activities to maintain competencies
 - Exercise
 - Training
 - Nothing
 - Other: _____
- Please identify the top barriers to continuing trauma training and certification
You can select multiple options **(up to 3)**
 - Location of the course
 - Frequency of the course offerings
 - Time off from work to attend
 - Financial support
 - Administrative support
 - Usefulness of the course
 - Not required for my job
 - Other: _____
- I have heard about the Rural Trauma Team Development (RTTD) courses
 - No
 - Yes
 - ◆ I know what is covered in RTTD courses
 - No
 - Yes
 - ◆ RTTD courses are offered by my facility/department
 - No
 - Unsure
 - Yes
 - ◆ RTTD courses are offered within my geographical area
 - No
 - Unsure
 - Yes
 - ◆ We are having trouble bringing an RTTD course to our facility/department
 - No
 - Unsure
 - Yes
 - ◆ I have an interest in attending an RTTD course

Ohio Trauma Education and Certification

- No
- Unsure
- Yes
- ◆ I have attended an RTTD course
 - No
 - Unsure
 - Yes
- ◆ Open question: what barriers have you experienced with regard to RTTD courses?
- Do you have any additional comments or feedback?

Education: Non-hospital EMS

- Please indicate the primary location of your institution (county)
 - Dropdown menu of all counties in Ohio
- Please indicate the types of personnel you have in your agency/service
 - Full-time paid
 - Part-time paid
 - Volunteer (non-paid, nominal pay, or paid per-call)
- Clinical trauma education provided

Please indicate all the courses that your agency/service offers: Certification offered annually, Certification offered periodically, Certification not offered at my agency/service

 - ATLS
 - BTLS/ITLS
 - PHTLS
 - RTTD
 - Ohio Trauma Triage Course (2 hours)
- Record keeping
 - Are your records of certification/training kept on hard copy (paper)?
 - Are your records of certification/training kept electronically?
 - Does your institution track that all staff is up-to-date on certification/training?
 - Does your institution remind staff when they need to renew certification/training?
- Performance improvement activities
 - Does your agency/service have a peer review process for trauma?
 - Does your agency/service have a QA/Performance Improvement Program?
 - ◆ If yes to either question

Ohio Trauma Education and Certification

- Does your agency/service have a formalized written process for performance improvement?
- How often does your agency/service conduct trauma-specific performance improvement activities?
- Do you think the trauma-specific performance improvement activities improve your agency/service?
- What barriers are there in conducting the trauma-specific performance improvement activities?
- Would it be helpful to have more thorough guidance regarding the Peer Review and QA/Performance improvement process?
- Clinical trauma education feedback
Please indicate your agreement with each of the following statements: Strongly Disagree, Disagree, Agree, Strongly Agree
 - I have observed poor turn out at in-service
 - I have observed lack of interest at in-service
 - I have observed lack of time at in-service
 - I have observed lack of financial support
 - I would like to see a minimum of 8 hours of trauma training and 2 hours of QI process to be added as a requirement for renewal.
 - I believe that consistent state standards are required for trauma education
- Between certifications, my institution/department provides these activities to maintain competencies
 - Exercise
 - Training
 - Nothing
 - Other: _____
- Please identify the top barriers to continuing trauma training and certification
You can select multiple options **(up to 3)**
 - Location of the course
 - Frequency of the course offerings
 - Time off from work to attend
 - Financial support
 - Administrative support
 - Usefulness of the course
 - Not required for my job
 - Other: _____
- I have heard about the Rural Trauma Team Development (RTTD) courses

- No
- Yes
 - ◆ I know what is covered in RTTD courses
 - No
 - Yes
 - ◆ RTTD courses are offered by my facility/department
 - No
 - Unsure
 - Yes
 - ◆ RTTD courses are offered within my geographical area
 - No
 - Unsure
 - Yes
 - ◆ We are having trouble bringing an RTTD course to our facility/department
 - No
 - Unsure
 - Yes
 - ◆ I have an interest in attending an RTTD course
 - No
 - Unsure
 - Yes
 - ◆ I have attended an RTTD course
 - No
 - Unsure
 - Yes
 - ◆ Open question: what barriers have you experienced with regard to RTTD courses?
- Do you have any additional comments or feedback?

Education: All Except Non-hospital EMS

- Please indicate your primary type of institution
 - Level 1 trauma hospital (Adult)
 - Level 1 trauma hospital (Pediatric)
 - Level 2 trauma hospital (Adult)
 - Level 2 trauma hospital (Pediatric)

Ohio Trauma Education and Certification

- Level 3 trauma hospital (Adult)
- Freestanding emergency department
- Critical access hospital
- Non-trauma hospital
- Please indicate the primary location of your institution (county)
 - Dropdown menu of all counties in Ohio
- Clinical trauma education provided

Please indicate all the courses that your agency/service offers: Certification offered annually, Certification offered periodically, Certification not offered at my agency/service

 - American Association for Surgery of Trauma
 - Annual National Trauma Refresher Course
 - ATCN
 - ATLS
 - BTLS/ITLS
 - CATN
 - Eastern Association for Trauma
 - PHTLS
 - RTTD
 - TCAR
 - TNCC
- Record keeping
 - Are your records of certification/training kept on hard copy (paper)?
 - Are your records of certification/training kept electronically?
 - Does your institution track that all staff is up-to-date on certification/training?
 - Does your institution remind staff when they need to renew certification/training?
- Performance improvement activities
 - Does your agency/service have a peer review process for trauma?
 - Does your agency/service have a QA/Performance Improvement Program?
 - ◆ If yes to either question
 - Does your agency/service have a formalized written process for performance improvement?
 - How often does your agency/service conduct trauma-specific performance improvement activities?
 - Do you think the trauma-specific performance improvement activities improve your agency/service?

Ohio Trauma Education and Certification

- What barriers are there in conducting the trauma-specific performance improvement activities?
- Would it be helpful to have more thorough guidance regarding the Peer Review and QA/Performance improvement process?
- Clinical trauma education feedback


Please indicate your agreement with each of the following statements: Strongly Disagree, Disagree, Agree, Strongly Agree

 - I have observed poor turn out at in-service
 - I have observed lack of interest at in-service
 - I have observed lack of time at in-service
 - I have observed lack of financial support
 - I would like to see a minimum of 8 hours of trauma training and 2 hours of QI process to be added as a requirement for renewal.
 - I believe that consistent state standards are required for trauma education
- Between certifications, my institution/department provides these activities to maintain competencies
 - Exercise
 - Training
 - Nothing
 - Other: _____
- Please identify the top barriers to continuing trauma training and certification
You can select multiple options (**up to 3**)
 - Location of the course
 - Frequency of the course offerings
 - Time off from work to attend
 - Financial support
 - Administrative support
 - Usefulness of the course
 - Not required for my job
 - Other: _____
- I have heard about the Rural Trauma Team Development (RTTD) courses
 - No
 - Yes
 - ◆ I know what is covered in RTTD courses
 - No
 - Yes


Ohio Trauma Education and Certification

- ◆ RTTD courses are offered by my facility/department
 - No
 - Unsure
 - Yes
- ◆ RTTD courses are offered within my geographical area
 - No
 - Unsure
 - Yes
- ◆ We are having trouble bringing an RTTD course to our facility/department
 - No
 - Unsure
 - Yes
- ◆ I have an interest in attending an RTTD course
 - No
 - Unsure
 - Yes
- ◆ I have attended an RTTD course
 - No
 - Unsure
 - Yes
- ◆ Open question: what barriers have you experienced with regard to RTTD courses?
- Do you have any additional comments or feedback?

Appendix B: Online Survey Announcement

SAFETY SERVICE PROTECTION

**OHIO EMERGENCY
MEDICAL SERVICES**



Melvin House, Executive Director
www.ems.ohio.gov

ATTENTION OHIO TRAUMA CARE PROVIDERS

The Ohio Trauma System is designed to get severely injured patients to the “right hospital, in the right manner, in the right amount of time.” These three factors increase the patient’s chances of survival while minimizing chances of suffering severe disabilities and death. One of the Ohio Trauma Committee’s goals is to ensure that trauma care providers in Ohio have the appropriate training to deliver state-of-the-art care to all trauma patients.

To that end, researchers at Innovative Emergency Management (IEM) have been contracted by the Ohio Department of Public Safety Division of EMS to provide an analysis of the current level of preparedness of Ohio’s trauma care providers. We invite you to participate in a brief survey that will help us better understand the current status of trauma care and identify potential barriers to trauma education and training required for physicians, emergency department nursing staff, and EMS personnel. Your participation in this survey will help strengthen Ohio’s Trauma System through identification of any gaps in education and training that could better focus future educational efforts for those who provide trauma care.

The trauma education and training survey will be open for responses starting July 8, 2019, and will conclude at the end of the day on August 2, 2019. We encourage you to access and complete this important survey using the following link: <https://app.geospiza.us/ohioems>

The survey will take about 5 minutes to complete. We will not collect any identifying information and your responses are completely anonymous. Feel free to share this link with other physicians, nurses, or EMS personnel who provide trauma care in Ohio.

On behalf of the Ohio Trauma Committee, we thank you for recognizing the importance of this research and for taking a few minutes of your time now to help strengthen future trauma care in Ohio.

Sincerely,

Diane Simon, RN, CEN, Chair, Ohio Trauma Committee
Sid Baccam, PhD, Manager, IEM Information Solutions & Emerging Technologies

Ohio Department of Public Safety
www.publicsafety.ohio.gov

Mike DeWine, Governor
Thomas J. Stickrath, Director

This page intentionally left blank.

Appendix C: Regional Physician Advisory Board Regional Data

Clinical Respondents

Statewide

	Physicians	Nurses	EMS	Total
Number of Responses	185	328	650	1,163
Percentage of Responses	16%	28%	56%	100%

Region 1

	Physicians	Nurses	EMS	Total
Number of Responses	20	77	85	182
Percentage of Responses	11%	42%	47%	100%

Region 2

	Physicians	Nurses	EMS	Total
Number of Responses	30	14	68	112
Percentage of Responses	27%	13%	61%	100%

Region 3

	Physicians	Nurses	EMS	Total
Number of Responses	6	47	100	153
Percentage of Responses	4%	31%	65%	100%

Region 4

	Physicians	Nurses	EMS	Total
Number of Responses	39	90	101	230
Percentage of Responses	17%	39%	44%	100%

Region 5

	Physicians	Nurses	EMS	Total
Number of Responses	19	21	132	172
Percentage of Responses	11%	12%	77%	100%

Region 6

	Physicians	Nurses	EMS	Total
Number of Responses	41	48	76	165
Percentage of Responses	25%	29%	46%	100%

Region 7

	Physicians	Nurses	EMS	Total
Number of Responses	13	11	34	58
Percentage of Responses	22%	19%	59%	100%

Region 8

	Physicians	Nurses	EMS	Total
Number of Responses	15	13	50	78
Percentage of Responses	19%	17%	64%	100%

EMS Level of Practice*Statewide*

EMS Certification	Number of Responses	Percentage of Responses
Paramedic	425	65%
AEMT	71	11%
EMT	136	21%
EMR	18	3%
Total	650	100%

Region 1

EMS Certification	Number of Responses	Percentage of Responses
Paramedic	56	66%
AEMT	11	13%
EMT	15	18%
EMR	3	4%
Total	85	100%

Region 2

EMS Certification	Number of Responses	Percentage of Responses
Paramedic	52	76%
AEMT	1	1%
EMT	13	19%
EMR	2	3%
Total	68	100%

Region 3

EMS Certification	Number of Responses	Percentage of Responses
Paramedic	72	72%
AEMT	6	6%
EMT	20	20%
EMR	2	2%
Total	100	100%

Region 4

EMS Certification	Number of Responses	Percentage of Responses
Paramedic	68	67%
AEMT	13	13%
EMT	17	17%
EMR	3	3%
Total	101	100%

Region 5

EMS Certification	Number of Responses	Percentage of Responses
Paramedic	88	67%
AEMT	15	11%
EMT	26	20%
EMR	3	2%
Total	132	100%

Region 6

EMS Certification	Number of Responses	Percentage of Responses
Paramedic	46	61%
AEMT	5	7%
EMT	24	32%
EMR	1	1%
Total	76	100%

Region 7

EMS Certification	Number of Responses	Percentage of Responses
Paramedic	16	47%
AEMT	9	26%
EMT	6	18%
EMR	3	9%
Total	34	100%

Region 8

EMS Certification	Number of Responses	Percentage of Responses
Paramedic	25	50%
AEMT	10	20%
EMT	14	28%
EMR	1	2%
Total	50	100%

Nursing Level of Practice

Statewide

Nurse Certification	Number of Responses	Percentage of Responses
RN	315	96%
LPN	3	1%
APRN	10	3%
Total	328	100%

Region 1

Nurse Certification	Number of Responses	Percentage of Responses
RN	74	96%
LPN	2	3%
APRN	1	1%
Total	77	100%

Region 2

Nurse Certification	Number of Responses	Percentage of Responses
RN	12	92%
LPN	0	0%
APRN	1	8%
Total	13	100%

Region 3

Nurse Certification	Number of Responses	Percentage of Responses
RN	45	96%
LPN	0	0%
APRN	2	4%
Total	47	100%

Region 4

Nurse Certification	Number of Responses	Percentage of Responses
RN	88	98%
LPN	0	0%
APRN	2	2%
Total	90	100%

Region 5

Nurse Certification	Number of Responses	Percentage of Responses
RN	20	95%
LPN	0	0%
APRN	1	5%
Total	21	100%

Region 6

Nurse Certification	Number of Responses	Percentage of Responses
RN	46	96%
LPN	0	0%
APRN	2	4%
Total	48	100%

Region 7

Nurse Certification	Number of Responses	Percentage of Responses
RN	11	100%
LPN	0	0%
APRN	0	0%
Total	11	100%

Region 8

Nurse Certification	Number of Responses	Percentage of Responses
RN	13	100%
LPN	0	0%
APRN	0	0%
Total	13	100%

Physicians Board Certification

Statewide

Board Certification	Number of Responses	Percentage of Responses
Emergency Medicine	116	52%
Surgery	31	14%
Pediatrics	25	11%
Pediatric Emergency Medicine	12	5%
Family Practice	8	4%
Oral & Maxillofacial Surgery	7	3%
EMS	7	3%
Critical Care	5	2%
Internal Medicine	4	2%
Surgical Critical Care	4	2%
Pediatric Surgery	2	1%
Radiology	1	0%
Total	222	100%

Region 1

Board Certification	Number of Responses	Percentage of Responses
Emergency Medicine	13	68%
Surgery	1	5%
Pediatrics	0	0%
Pediatric Emergency Medicine	0	0%
Family Practice	2	11%
Oral & Maxillofacial Surgery	1	5%
EMS	1	5%
Critical Care	0	0%
Internal Medicine	1	5%
Surgical Critical Care	0	0%
Pediatric Surgery	0	0%
Radiology	0	0%
Total	19	100%

Region 2

Board Certification	Number of Responses	Percentage of Responses
Emergency Medicine	25	66%
Surgery	4	11%
Pediatrics	1	3%
Pediatric Emergency Medicine	0	0%
Family Practice	2	5%
Oral & Maxillofacial Surgery	1	3%
EMS	2	5%
Critical Care	1	3%
Internal Medicine	0	0%
Surgical Critical Care	1	3%
Pediatric Surgery	1	3%
Radiology	0	0%
Total	38	100%

Region 3

Board Certification	Number of Responses	Percentage of Responses
Emergency Medicine	4	50%
Surgery	3	38%
Pediatrics	0	0%
Pediatric Emergency Medicine	0	0%
Family Practice	0	0%
Oral & Maxillofacial Surgery	0	0%
EMS	0	0%
Critical Care	1	13%
Internal Medicine	0	0%
Surgical Critical Care	0	0%
Pediatric Surgery	0	0%
Radiology	0	0%
Total	8	100%

Region 4

Board Certification	Number of Responses	Percentage of Responses
Emergency Medicine	18	38%
Surgery	8	17%
Pediatrics	6	13%
Pediatric Emergency Medicine	5	10%
Family Practice	2	4%
Oral & Maxillofacial Surgery	1	2%
EMS	1	2%
Critical Care	2	4%
Internal Medicine	2	4%
Surgical Critical Care	1	2%
Pediatric Surgery	1	2%
Radiology	1	2%
Total	48	100%

Region 5

Board Certification	Number of Responses	Percentage of Responses
Emergency Medicine	16	73%
Surgery	3	14%
Pediatrics	0	0%
Pediatric Emergency Medicine	0	0%
Family Practice	0	0%
Oral & Maxillofacial Surgery	1	5%
EMS	2	9%
Critical Care	0	0%
Internal Medicine	0	0%
Surgical Critical Care	0	0%
Pediatric Surgery	0	0%
Radiology	0	0%
Total	22	100%

Region 6

Board Certification	Number of Responses	Percentage of Responses
Emergency Medicine	16	28%
Surgery	10	18%
Pediatrics	17	30%
Pediatric Emergency Medicine	7	12%
Family Practice	1	2%
Oral & Maxillofacial Surgery	3	5%
EMS	1	2%
Critical Care	1	2%
Internal Medicine	0	0%
Surgical Critical Care	1	2%
Pediatric Surgery	0	0%
Radiology	0	0%
Total	57	100%

Region 7

Board Certification	Number of Responses	Percentage of Responses
Emergency Medicine	10	59%
Surgery	1	6%
Pediatrics	1	6%
Pediatric Emergency Medicine	0	0%
Family Practice	3	18%
Oral & Maxillofacial Surgery	0	0%
EMS	0	0%
Critical Care	1	6%
Internal Medicine	1	6%
Surgical Critical Care	0	0%
Pediatric Surgery	0	0%
Radiology	0	0%
Total	17	100%

Region 8

Board Certification	Number of Responses	Percentage of Responses
Emergency Medicine	13	87%
Surgery	1	7%
Pediatrics	0	0%
Pediatric Emergency Medicine	0	0%
Family Practice	0	0%
Oral & Maxillofacial Surgery	0	0%
EMS	0	0%
Critical Care	0	0%
Internal Medicine	0	0%
Surgical Critical Care	1	7%
Pediatric Surgery	0	0%
Radiology	0	0%
Total	15	100%

*Clinician Experience**Statewide*

Years of Experience	Physicians	Nurses	EMS
<1 year	5 (3%)	9 (3%)	13 (2%)
1 year	3 (2%)	12 (4%)	11 (2%)
2 years	3 (2%)	22 (7%)	20 (3%)
3–5 years	21 (11%)	55 (17%)	34 (5%)
6–10 years	38 (21%)	73 (22%)	65 (10%)
11–15 years	31 (17%)	46 (14%)	70 (11%)
16–20 years	20 (11%)	31 (9%)	77 (12%)
20+ years	64 (35%)	79 (24%)	360 (55%)
Total	185	327	650

Region 1

Years of Experience	Physicians	Nurses	EMS
<1 year	0 (0%)	3 (4%)	1 (1%)
1 year	0 (0%)	3 (4%)	0 (0%)
2 years	2 (10%)	7 (9%)	3 (4%)
3–5 years	4 (20%)	10 (13%)	3 (4%)
6–10 years	5 (25%)	17 (22%)	9 (11%)
11–15 years	2 (10%)	10 (13%)	9 (11%)
16–20 years	1 (5%)	11 (14%)	14 (16%)
20+ years	6 (30%)	16 (21%)	46 (54%)
Total	20	77	85

Region 2

Years of Experience	Physicians	Nurse	EMS
<1 year	3 (10%)	0 (0%)	2 (3%)
1 year	0 (0%)	3 (21%)	2 (3%)
2 years	0 (0%)	1 (7%)	1 (1%)
3–5 years	3 (10%)	2 (14%)	2 (3%)
6–10 years	6 (20%)	1 (7%)	2 (3%)
11–15 years	6 (20%)	0 (0%)	5 (7%)
16–20 years	1 (3%)	1 (7%)	9 (13%)
20+ years	11 (37%)	6 (43%)	45 (66%)
Total	30	14	68

Region 3

Years of Experience	Physicians	Nurses	EMS
<1 year	0 (0%)	2 (4%)	5 (5%)
1 year	0 (0%)	1 (2%)	4 (4%)
2 years	0 (0%)	4 (9%)	4 (4%)
3–5 years	1 (17%)	5 (11%)	8 (8%)
6–10 years	1 (17%)	9 (19%)	11 (11%)
11–15 years	3 (50%)	8 (17%)	14 (14%)
16–20 years	0 (0%)	4 (9%)	8 (8%)
20+ years	1 (17%)	14 (30%)	46 (46%)
Total	6	47	100

Region 4

Years of Experience	Physicians	Nurses	EMS
<1 year	0 (0%)	2 (2%)	1 (1%)
1 year	0 (0%)	3 (3%)	1 (1%)
2 years	0 (0%)	6 (7%)	2 (2%)
3–5 years	2 (5%)	18 (20%)	8 (8%)
6–10 years	10 (26%)	22 (24%)	10 (10%)
11–15 years	5 (13%)	13 (14%)	7 (7%)
16–20 years	8 (21%)	8 (9%)	16 (16%)
20+ years	14 (36%)	18 (20%)	56 (55%)
Total	39	90	101

Region 5

Years of Experience	Physicians	Nurses	EMS
<1 year	0 (0%)	0 (0%)	2 (2%)
1 year	0 (0%)	0 (0%)	1 (1%)
2 years	0 (0%)	1 (5%)	5 (4%)
3–5 years	1 (5%)	4 (19%)	1 (1%)
6–10 years	3 (16%)	6 (29%)	10 (8%)
11–15 years	3 (16%)	1 (5%)	18 (14%)
16–20 years	1 (5%)	2 (10%)	16 (12%)
20+ years	11 (58%)	7 (33%)	79 (60%)
Total	19	21	132

Region 6

Years of Experience	Physicians	Nurses	EMS
<1 year	1 (2%)	0 (0%)	1 (1%)
1 year	2 (5%)	1 (2%)	1 (1%)
2 years	0 (0%)	2 (4%)	5 (7%)
3–5 years	7 (17%)	11 (23%)	5 (7%)
6–10 years	10 (24%)	11 (23%)	9 (12%)
11–15 years	7 (17%)	9 (19%)	9 (12%)
16–20 years	4 (10%)	2 (4%)	7 (9%)
20+ years	10 (24%)	12 (25%)	39 (51%)
Total	41	48	76

Region 7

Years of Experience	Physicians	Nurses	EMS
<1 year	1 (8%)	0 (0%)	0 (0%)
1 year	1 (8%)	0 (0%)	1 (3%)
2 years	1 (8%)	1 (9%)	0 (0%)
3–5 years	1 (8%)	2 (18%)	3 (9%)
6–10 years	0 (0%)	2 (18%)	7 (21%)
11–15 years	0 (0%)	1 (9%)	1 (3%)
16–20 years	2 (15%)	1 (9%)	4 (12%)
20+ years	7 (54%)	4 (36%)	18 (53%)
Total	13	11	34

Region 8

Years of Experience	Physicians	Nurses	EMS
<1 year	0 (0%)	0 (0%)	1 (2%)
1 year	0 (0%)	0 (0%)	1 (2%)
2 years	0 (0%)	0 (0%)	0 (0%)
3–5 years	1 (7%)	2 (15%)	4 (8%)
6–10 years	3 (20%)	3 (23%)	6 (12%)
11–15 years	4 (27%)	4 (31%)	7 (14%)
16–20 years	3 (20%)	2 (15%)	2 (4%)
20+ years	4 (27%)	2 (15%)	29 (58%)
Total	15	13	50

EMS Transportation Response Breakdown*Statewide*

EMS Transportation	Number of Responses	Percentage of Responses
EMS—Ground (Non-hospital based)	554	86%
EMS—Ground (Hospital-based)	80	12%
EMS—Aviation (Non-hospital based)	8	1%
EMS—Aviation (Hospital-based)	4	1%
Total	646	100%

Region 1

EMS Transportation	Number of Responses	Percentage of Responses
EMS—Ground (Non-hospital based)	73	86%
EMS—Ground (Hospital-based)	10	12%
EMS—Aviation (Non-hospital based)	0	0%
EMS—Aviation (Hospital-based)	2	2%
Total	85	100%

Region 2

EMS Transportation	Number of Responses	Percentage of Responses
EMS—Ground (Non-hospital based)	61	90%
EMS—Ground (Hospital-based)	7	10%
EMS—Aviation (Non-hospital based)	0	0%
EMS—Aviation (Hospital-based)	0	0%
Total	68	100%

Region 3

EMS Transportation	Number of Responses	Percentage of Responses
EMS—Ground (Non-hospital based)	85	85%
EMS—Ground (Hospital-based)	14	14%
EMS—Aviation (Non-hospital based)	1	1%
EMS—Aviation (Hospital-based)	0	0%
Total	100	100%

Region 4

EMS Transportation	Number of Responses	Percentage of Responses
EMS—Ground (Non-hospital based)	88	87%
EMS—Ground (Hospital-based)	12	12%
EMS—Aviation (Non-hospital based)	1	1%
EMS—Aviation (Hospital-based)	0	0%
Total	101	100%

Region 5

EMS Transportation	Number of Responses	Percentage of Responses
EMS—Ground (Non-hospital based)	113	86%
EMS—Ground (Hospital-based)	17	13%
EMS—Aviation (Non-hospital based)	1	1%
EMS—Aviation (Hospital-based)	1	1%
Total	132	100%

Region 6

EMS Transportation	Number of Responses	Percentage of Responses
EMS—Ground (Non-hospital based)	65	86%
EMS—Ground (Hospital-based)	10	13%
EMS—Aviation (Non-hospital based)	1	1%
EMS—Aviation (Hospital-based)	0	0%
Total	76	100%

Region 7

EMS Transportation	Number of Responses	Percentage of Responses
EMS—Ground (Non-hospital based)	28	82%
EMS—Ground (Hospital-based)	4	12%
EMS—Aviation (Non-hospital based)	1	3%
EMS—Aviation (Hospital-based)	1	3%
Total	34	100%

Region 8

EMS Transportation	Number of Responses	Percentage of Responses
EMS—Ground (Non-hospital based)	43	86%
EMS—Ground (Hospital-based)	6	12%
EMS—Aviation (Non-hospital based)	1	2%
EMS—Aviation (Hospital-based)	0	0%
Total	50	100%

EMS Ground Employee Breakdown

Statewide

Employment Status	Hospital-based EMS	Non-hospital-based EMS
Full-time Paid	52 (65%)	308 (56%)
Part-time Paid	19 (24%)	95 (17%)
Volunteer (non-paid, nominal pay, or paid per-call)	9 (11%)	150 (27%)
Total	80	553

Region 1

Employment Status	Hospital-based EMS	Non-hospital-based EMS
Full-time Paid	9 (90%)	36 (51%)
Part-time Paid	1 (10%)	6 (8%)
Volunteer (non-paid, nominal pay, or paid per-call)	0 (0%)	29 (41%)
Total	10	71

Region 2

Employment Status	Hospital-based EMS	Non-hospital-based EMS
Full-time Paid	3 (43%)	43 (70%)
Part-time Paid	2 (29%)	11 (18%)
Volunteer (non-paid, nominal pay, or paid per-call)	2 (29%)	7 (11%)
Total	7	61

Region 3

Employment Status	Hospital-based EMS	Non-hospital-based EMS
Full-time Paid	11 (79%)	51 (60%)
Part-time Paid	2 (14%)	20 (24%)
Volunteer (non-paid, nominal pay, or paid per-call)	1 (7%)	14 (16%)
Total	14	85

Region 4

Employment Status	Hospital-based EMS	Non-hospital-based EMS
Full-time Paid	9 (75%)	53 (60%)
Part-time Paid	2 (17%)	12 (14%)
Volunteer (non-paid, nominal pay, or paid per-call)	1 (18%)	23 (26%)
Total	12	88

Region 5

Employment Status	Hospital-based EMS	Non-hospital-based EMS
Full-time Paid	11 (65%)	66 (58%)
Part-time Paid	4 (24%)	16 (14%)
Volunteer (non-paid, nominal pay, or paid per-call)	2 (12%)	31 (27%)
Total	17	113

Region 6

Employment Status	Hospital-based EMS	Non-hospital-based EMS
Full-time Paid	5 (50%)	36 (56%)
Part-time Paid	4 (40%)	14 (22%)
Volunteer (non-paid, nominal pay, or paid per-call)	1 (10%)	14 (22%)
Total	10	64

Region 7

Employment Status	Hospital-based EMS	Non-hospital-based EMS
Full-time Paid	0 (0%)	9 (32%)
Part-time Paid	3 (75%)	6 (21%)
Volunteer (non-paid, nominal pay, or paid per-call)	1 (25%)	13 (46%)
Total	4	28

Region 8

Employment Status	Hospital-based EMS	Non-hospital-based EMS
Full-time Paid	4 (67%)	14 (33%)
Part-time Paid	1 (17%)	10 (23%)
Volunteer (non-paid, nominal pay, or paid per-call)	1 (17%)	19 (44%)
Total	6	43

EMS Trauma Certifications*Statewide*

	ATLS	BTLS/ITLS	PHTLS
Taken	298 (49%)	519 (85%)	394 (65%)
Ever Certified	221 (36%)	415 (68%)	315 (52%)
• Current	71 (32%)	196 (47%)	138 (44%)
• Not Current	150 (68%)	219 (53%)	177 (56%)
Total	612	614	610

Region 1

	ATLS	BTLS/ITLS	PHTLS
Taken	35 (43%)	72 (89%)	54 (67%)
Ever Certified	26 (32%)	52 (64%)	44 (54%)
• Current	8 (31%)	23 (44%)	20 (45%)
• Not Current	18 (69%)	29 (56%)	24 (55%)
Total	81	81	81

Region 2

	ATLS	BTLS/ITLS	PHTLS
Taken	31 (47%)	55 (83%)	42 (64%)
Ever Certified	25 (38%)	45 (68%)	36 (55%)
• Current	8 (32%)	16 (36%)	12 (33%)
• Not Current	17 (68%)	29 (64%)	24 (67%)
Total	66	66	66

Region 3

	ATLS	BTLS/ITLS	PHTLS
Taken	51 (55%)	78 (85%)	64 (69%)
Ever Certified	41 (45%)	64 (70%)	50 (54%)
• Current	14 (34%)	31 (48%)	22 (44%)
• Not Current	27 (66%)	33 (52%)	28 (56%)
Total	92	92	93

Region 4

	ATLS	BTLS/ITLS	PHTLS
Taken	54 (56%)	83 (86%)	70 (73%)
Ever Certified	35 (36%)	61 (63%)	52 (54%)
• Current	12 (34%)	29 (48%)	26 (50%)
• Not Current	23 (66%)	32 (52%)	26 (50%)
Total	96	97	96

Region 5

	ATLS	BTLS/ITLS	PHTLS
Taken	61 (49%)	103 (87%)	86 (70%)
Ever Certified	43 (35%)	90 (73%)	69 (57%)
• Current	12 (28%)	41 (46%)	29 (42%)
• Not Current	31 (72%)	49 (54%)	40 (58%)
Total	124	124	122

Region 6

	ATLS	BTLS/ITLS	PHTLS
Taken	34 (47%)	60 (82%)	37 (51%)
Ever Certified	26 (36%)	52 (71%)	28 (38%)
• Current	8 (31%)	30 (58%)	9 (32%)
• Not Current	18 (69%)	22 (42%)	19 (68%)
Total	73	73	73

Region 7

	ATLS	BTLS/ITLS	PHTLS
Taken	13 (41%)	23 (70%)	17 (53%)
Ever Certified	10 (31%)	15 (45%)	15 (47%)
• Current	4 (40%)	10 (67%)	11 (73%)
• Not Current	6 (60%)	5 (33%)	4 (27%)
Total	32	33	32

Region 8

	ATLS	BTLS/ITLS	PHTLS
Taken	18 (38%)	40 (85%)	23 (50%)
Ever Certified	14 (30%)	36 (77%)	20 (43%)
• Current	5 (36%)	16 (44%)	9 (45%)
• Not Current	9 (64%)	20 (56%)	11 (55%)
Total	47	47	46

Physicians and Nurses in Different Types of Facilities

Statewide

	Physicians	Nurses
Level 1 Trauma Hospital (Adult)	48 (26%)	65 (20%)
Level 1 Trauma Hospital (Pediatric)	29 (16%)	51 (16%)
Level 2 Trauma Hospital (Adult)	15 (8%)	14 (4%)
Level 2 Trauma Hospital (Pediatric)	1 (1%)	12 (4%)
Level 3 Trauma Hospital (Adult)	32 (17%)	48 (15%)
Freestanding Emergency Department	6 (3%)	10 (3%)
Critical Access Hospital	12 (7%)	51 (16%)
Non-Trauma Hospital	40 (22%)	69 (22%)
Total	183	320

Ohio Trauma Education and Certification

Region 1

	Physicians	Nurses
Level 1 Trauma Hospital (Adult)	8 (40%)	17 (22%)
Level 1 Trauma Hospital (Pediatric)	0 (0%)	1 (1%)
Level 2 Trauma Hospital (Adult)	1 (5%)	3 (4%)
Level 2 Trauma Hospital (Pediatric)	0 (0%)	1 (1%)
Level 3 Trauma Hospital (Adult)	4 (20%)	18 (23%)
Freestanding Emergency Department	1 (5%)	1 (1%)
Critical Access Hospital	1 (5%)	19 (25%)
Non-Trauma Hospital	5 (25%)	17 (22%)
Total	20	77

Region 2

	Physicians	Nurses
Level 1 Trauma Hospital (Adult)	9 (30%)	10 (71%)
Level 1 Trauma Hospital (Pediatric)	1 (3%)	0 (0%)
Level 2 Trauma Hospital (Adult)	5 (17%)	1 (7%)
Level 2 Trauma Hospital (Pediatric)	0 (0%)	0 (0%)
Level 3 Trauma Hospital (Adult)	5 (17%)	0 (0%)
Freestanding Emergency Department	2 (7%)	0 (0%)
Critical Access Hospital	0 (0%)	1 (7%)
Non-Trauma Hospital	8 (27%)	2 (14%)
Total	30	14

Region 3

	Physicians	Nurses
Level 1 Trauma Hospital (Adult)	5 (83%)	20 (43%)
Level 1 Trauma Hospital (Pediatric)	0 (0%)	0 (0%)
Level 2 Trauma Hospital (Adult)	1 (17%)	1 (2%)
Level 2 Trauma Hospital (Pediatric)	0 (0%)	0 (0%)
Level 3 Trauma Hospital (Adult)	0 (0%)	1 (2%)
Freestanding Emergency Department	0 (0%)	5 (11%)
Critical Access Hospital	0 (0%)	4 (9%)
Non-Trauma Hospital	0 (0%)	15 (33%)
Total	6	46

Region 4

	Physicians	Nurses
Level 1 Trauma Hospital (Adult)	9 (23%)	7 (8%)
Level 1 Trauma Hospital (Pediatric)	10 (26%)	40 (44%)
Level 2 Trauma Hospital (Adult)	3 (8%)	8 (9%)
Level 2 Trauma Hospital (Pediatric)	0 (0%)	0 (0%)
Level 3 Trauma Hospital (Adult)	5 (13%)	0 (0%)
Freestanding Emergency Department	1 (3%)	1 (1%)
Critical Access Hospital	4 (10%)	12 (13%)
Non-Trauma Hospital	7 (18%)	22 (24%)
Total	39	90

Region 5

	Physicians	Nurses
Level 1 Trauma Hospital (Adult)	6 (32%)	5 (24%)
Level 1 Trauma Hospital (Pediatric)	0 (0%)	0 (0%)
Level 2 Trauma Hospital (Adult)	3 (16%)	1 (5%)
Level 2 Trauma Hospital (Pediatric)	1 (5%)	11 (52%)
Level 3 Trauma Hospital (Adult)	1 (5%)	1 (5%)
Freestanding Emergency Department	1 (5%)	0 (0%)
Critical Access Hospital	0 (0%)	2 (10%)
Non-Trauma Hospital	7 (37%)	1 (5%)
Total	19	21

Region 6

	Physicians	Nurses
Level 1 Trauma Hospital (Adult)	11 (27%)	5 (10%)
Level 1 Trauma Hospital (Pediatric)	18 (44%)	10 (21%)
Level 2 Trauma Hospital (Adult)	2 (5%)	0 (0%)
Level 2 Trauma Hospital (Pediatric)	0 (0%)	0 (0%)
Level 3 Trauma Hospital (Adult)	6 (15%)	26 (54%)
Freestanding Emergency Department	0 (0%)	1 (2%)
Critical Access Hospital	2 (5%)	0 (0%)
Non-Trauma Hospital	2 (5%)	6 (13%)
Total	41	48

Region 7

	Physicians	Nurses
Level 1 Trauma Hospital (Adult)	0 (0%)	1 (9%)
Level 1 Trauma Hospital (Pediatric)	0 (0%)	0 (0%)
Level 2 Trauma Hospital (Adult)	0 (0%)	0 (0%)
Level 2 Trauma Hospital (Pediatric)	0 (0%)	0 (0%)
Level 3 Trauma Hospital (Adult)	1 (8%)	0 (0%)
Freestanding Emergency Department	1 (8%)	2 (18%)
Critical Access Hospital	5 (38%)	5 (45%)
Non-Trauma Hospital	6 (46%)	3 (27%)
Total	13	11

Region 8

	Physicians	Nurses
Level 1 Trauma Hospital (Adult)	0 (0%)	0 (0%)
Level 1 Trauma Hospital (Pediatric)	0 (0%)	0 (0%)
Level 2 Trauma Hospital (Adult)	0 (0%)	0 (0%)
Level 2 Trauma Hospital (Pediatric)	0 (0%)	0 (0%)
Level 3 Trauma Hospital (Adult)	10 (67%)	2 (15%)
Freestanding Emergency Department	0 (0%)	0 (0%)
Critical Access Hospital	0 (0%)	8 (62%)
Non-Trauma Hospital	5 (33%)	3 (23%)
Total	15	13

Nurse Trauma Certifications

Statewide

	ATCN	ATLS	BTLS/ITLS	CATN	PHTLS	TCAR	TNCC
Taken	13 (4%)	71 (23%)	107 (35%)	17 (6%)	49 (16%)	30 (10%)	242 (79%)
Ever Certified	10 (3%)	46 (15%)	89 (29%)	11 (4%)	43 (14%)	16 (5%)	219 (71%)
• Current	7 (70%)	33 (72%)	57 (64%)	4 (36%)	25 (38%)	14 (88%)	186 (85%)
• Not Current	3 (30%)	13 (28%)	32 (36%)	7 (64%)	18 (42%)	2 (13%)	33 (15%)
Total	305	305	306	305	305	305	307

Ohio Trauma Education and Certification

Region 1

	ATCN	ATLS	BTLS/ITLS	CATN	PHTLS	TCAR	TNCC
Taken	7 (9%)	9 (12%)	26 (35%)	3 (4%)	9 (12%)	5 (7%)	58 (77%)
Ever Certified	5 (7%)	8 (11%)	21 (28%)	1 (1%)	9 (12%)	3 (4%)	51 (68%)
• Current	3 (60%)	5 (63%)	15 (71%)	1 (100%)	6 (67%)	2 (67%)	41 (80%)
• Not Current	2 (40%)	3 (37%)	6 (29%)	0 (0%)	3 (33%)	1 (33%)	10 (20%)
Total	75	75	75	75	75	75	75

Region 2

	ATCN	ATLS	BTLS/ITLS	CATN	PHTLS	TCAR	TNCC
Taken	1 (8%)	2 (17%)	5 (42%)	0 (0%)	2 (17%)	2 (17%)	10 (83%)
Ever Certified	1 (8%)	2 (17%)	5 (42%)	0 (0%)	2 (17%)	2 (17%)	10 (83%)
• Current	1 (100%)	0 (0%)	3 (60%)	NA	1 (50%)	2 (100%)	8 (80%)
• Not Current	0 (0%)	2 (100%)	2 (40%)	NA	1 (50%)	0 (0%)	2 (20%)
Total	12	12	12	12	12	12	12

Region 3

	ATCN	ATLS	BTLS/ITLS	CATN	PHTLS	TCAR	TNCC
Taken	2 (5%)	13 (30%)	14 (33%)	8 (19%)	15 (35%)	5 (12%)	31 (72%)
Ever Certified	1 (2%)	7 (16%)	13 (30%)	7 (16%)	12 (28%)	2 (5%)	28 (65%)
• Current	1 (100%)	7 (100%)	7 (54%)	0 (0%)	8 (67%)	1 (50%)	20 (71%)
• Not Current	0 (0%)	0 (0%)	6 (46%)	7 (100%)	4 (33%)	1 (50%)	8 (29%)
Total	43	43	43	43	43	43	43

Ohio Trauma Education and Certification

Region 4

	ATCN	ATLS	BTLS/ITLS	CATN	PHTLS	TCAR	TNCC
Taken	1 (1%)	12 (14%)	26 (30%)	2 (2%)	11 (13%)	2 (2%)	68 (76%)
Ever Certified	1 (1%)	9 (10%)	22 (20%)	2 (2%)	10 (11%)	1 (1%)	61 (69%)
• Current	1 (100%)	4 (44%)	14 (64%)	2 (100%)	6 (60%)	1 (100%)	55 (90%)
• Not Current	0 (0%)	5 (56%)	8 (36%)	0 (0%)	4 (40%)	0 (0%)	6 (10%)
Total	88	88	88	88	88	88	89

Region 5

	ATCN	ATLS	BTLS/ITLS	CATN	PHTLS	TCAR	TNCC
Taken	0 (0%)	7 (35%)	6 (30%)	0 (0%)	2 (10%)	2 (10%)	21 (100%)
Ever Certified	0 (0%)	3 (15%)	5 (25%)	0 (0%)	2 (10%)	1 (10%)	19 (90%)
• Current	NA	2 (67%)	4 (80%)	NA	1 (50%)	1 (100%)	18 (95%)
• Not Current	NA	1 (33%)	1 (20%)	NA	1 (50%)	0 (0%)	1 (5%)
Total	20	20	20	20	20	20	21

Region 6

	ATCN	ATLS	BTLS/ITLS	CATN	PHTLS	TCAR	TNCC
Taken	1 (2%)	27 (60%)	22 (48%)	4 (9%)	7 (16%)	14 (31%)	38 (84%)
Ever Certified	1 (2%)	17 (38%)	19 (41%)	1 (2%)	6 (13%)	7 (16%)	38 (84%)
• Current	1 (100%)	15 (88%)	13 (68%)	1 (100%)	2 (33%)	7 (100%)	36 (95%)
• Not Current	0 (0%)	2 (12%)	6 (32%)	0 (0%)	4 (67%)	0 (0%)	2 (5%)
Total	45	45	46	45	45	45	45

Ohio Trauma Education and Certification

Region 7

	ATCN	ATLS	BTLS/ITLS	CATN	PHTLS	TCAR	TNCC
Taken	0 (0%)	1 (9%)	5 (45%)	0 (0%)	2 (18%)	0 (0%)	8 (73%)
Ever Certified	0 (0%)	0 (0%)	3 (27%)	0 (0%)	2 (18%)	0 (0%)	6 (55%)
• Current	NA	NA	1 (33%)	NA	1 (50%)	NA	4 (67%)
• Not Current	NA	NA	2 (67%)	NA	1 (50%)	NA	2 (33%)
Total	11	11	11	11	11	11	11

Region 8

	ATCN	ATLS	BTLS/ITLS	CATN	PHTLS	TCAR	TNCC
Taken	1 (9%)	0 (0%)	3 (27%)	0 (0%)	1 (9%)	0 (0%)	8 (73%)
Ever Certified	1 (1%)	0 (0%)	1 (9%)	0 (0%)	0 (0%)	0 (0%)	6 (55%)
• Current	0 (0%)	NA	0 (0%)	NA	NA	NA	4 (67%)
• Not Current	1 (100%)	NA	1 (100%)	NA	NA	NA	2 (33%)
Total	11	11	11	11	11	11	11

Physician Trauma Certifications

Statewide

	ATLS	BTLS/ITLS	PHTLS	EAT	AAST	ANTR
Taken	176 (97%)	93 (52%)	24 (13%)	15 (8%)	12 (7%)	6 (3%)
Ever Certified	154 (85%)	72 (40%)	17 (9%)	12 (7%)	9 (5%)	4 (2%)
• Current	93 (60%)	40 (56%)	5 (29%)	10 (83%)	8 (89%)	4 (100%)
• Not Current	61 (40%)	32 (44%)	12 (71%)	2 (17%)	1 (11%)	0 (0%)
Total	181	179	179	179	179	179

Ohio Trauma Education and Certification

Region 1

	ATLS	BTLS/ITLS	PHTLS	EAT	AAST	ANTR
Taken	20 (100%)	8 (40%)	3 (15%)	1 (5%)	0 (0%)	0 (0%)
Ever Certified	20 (100%)	5 (25%)	2 (10%)	1 (5%)	0 (0%)	0 (0%)
• Current	14 (70%)	4 (80%)	1 (50%)	1 (100%)	NA	NA
• Not Current	6 (30%)	1 (20%)	1 (50%)	0 (0%)	NA	NA
Total	20	20	20	20	20	20

Region 2

	ATLS	BTLS/ITLS	PHTLS	EAT	AAST	ANTR
Taken	27 (90%)	14 (48%)	4 (14%)	2 (7%)	2 (7%)	2 (7%)
Ever Certified	21 (70%)	10 (34%)	3 (10%)	2 (7%)	2 (7%)	1 (3%)
• Current	13 (62%)	5 (50%)	1 (33%)	2 (100%)	2 (100%)	1 (100%)
• Not Current	8 (38%)	5 (50%)	2 (67%)	0 (0%)	0 (0%)	0 (0%)
Total	30	29	29	29	29	29

Region 3

	ATLS	BTLS/ITLS	PHTLS	EAT	AAST	ANTR
Taken	6 (100%)	4 (67%)	1 (17%)	1 (17%)	0 (0%)	0 (0%)
Ever Certified	6 (100%)	3 (50%)	1 (17%)	1 (17%)	0 (0%)	0 (0%)
• Current	3 (50%)	1 (33%)	0 (0%)	1 (100%)	NA	NA
• Not Current	3 (50%)	2 (67%)	1 (100%)	0 (0%)	NA	NA
Total	6	6	6	6	6	6

Ohio Trauma Education and Certification

Region 4

	ATLS	BTLS/ITLS	PHTLS	EAT	AAST	ANTR
Taken	37 (100%)	22 (59%)	5 (14%)	5 (14%)	5 (14%)	1 (3%)
Ever Certified	31 (82%)	16 (43%)	3 (8%)	5 (14%)	5 (14%)	1 (3%)
• Current	17 (55%)	8 (50%)	0 (0%)	4 (80%)	4 (80%)	1 (100%)
• Not Current	14 (45%)	8 (50%)	3 (100%)	1 (20%)	1 (20%)	0 (0%)
Total	38	37	37	37	37	37

Region 5

	ATLS	BTLS/ITLS	PHTLS	EAT	AAST	ANTR
Taken	18 (100%)	9 (50%)	5 (28%)	0 (0%)	1 (6%)	2 (11%)
Ever Certified	15 (83%)	8 (44%)	4 (22%)	0 (0%)	1 (6%)	1 (6%)
• Current	5 (33%)	4 (50%)	1 (25%)	NA	1 (100%)	1 (100%)
• Not Current	10 (67%)	4 (50%)	3 (75%)	NA	0 (0%)	0 (0%)
Total	18	18	18	18	18	18

Region 6

	ATLS	BTLS/ITLS	PHTLS	EAT	AAST	ANTR
Taken	41 (100%)	18 (44%)	4 (10%)	5 (12%)	4 (10%)	0 (0%)
Ever Certified	36 (88%)	14 (34%)	3 (7%)	2 (5%)	1 (2%)	0 (0%)
• Current	25 (69%)	8 (57%)	2 (67%)	2 (100%)	1 (100%)	NA
• Not Current	11 (31%)	6 (43%)	1 (33%)	0 (0%)	0 (0%)	NA
Total	41	41	41	41	41	41

Ohio Trauma Education and Certification

Region 7

	ATLS	BTLS/ITLS	PHTLS	EAT	AAST	ANTR
Taken	12 (100%)	8 (67%)	1 (8%)	0 (0%)	0 (0%)	0 (0%)
Ever Certified	11 (92%)	7 (58%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
• Current	7 (64%)	4 (57%)	NA	NA	NA	NA
• Not Current	4 (36%)	3 (43%)	NA	NA	NA	NA
Total	12	12	12	12	12	12

Region 8

	ATLS	BTLS/ITLS	PHTLS	EAT	AAST	ANTR
Taken	15 (100%)	10 (67%)	1 (7%)	1 (7%)	0 (0%)	1 (7%)
Ever Certified	34 (93%)	9 (60%)	1 (7%)	1 (7%)	0 (0%)	1 (7%)
• Current	9 (64%)	6 (67%)	0 (0%)	0 (0%)	NA	1 (100%)
• Not Current	5 (36%)	3 (33%)	1 (100%)	1 (100%)	NA	0 (0%)
Total	15	15	15	15	15	15

Top Barriers to Continuing Trauma Training and Certification Statewide

	EMS	Nurses	Physicians
Location of the course	247 (19%)	72 (12%)	49 (14%)
Frequency of the course offerings	325 (25%)	133 (22%)	56 (16%)
Time off from work to attend	285 (22%)	146 (24%)	106 (30%)
Financial support	221 (17%)	123 (20%)	45 (13%)
Administrative support	69 (5%)	45 (7%)	13 (4%)
Usefulness of the course	92 (7%)	30 (5%)	49 (14%)
Not required for my job	45 (3%)	54 (9%)	29 (8%)
Other	36 (3%)	12 (2%)	8 (2%)
Total	1,320	615	355

Ohio Trauma Education and Certification

Region 1

	EMS	Nurses	Physicians
Location of the course	42 (23%)	16 (10%)	8 (21%)
Frequency of the course offerings	51 (28%)	34 (22%)	9 (24%)
Time off from work to attend	30 (17%)	36 (23%)	11 (29%)
Financial support	26 (14%)	33 (21%)	5 (13%)
Administrative support	9 (5%)	14 (9%)	1 (3%)
Usefulness of the course	9 (5%)	5 (3%)	1 (3%)
Not required for my job	8 (4%)	17 (11%)	3 (8%)
Other	5 (3%)	3 (2%)	0 (0%)
Total	180	158	38

Region 2

	EMS	Nurses	Physicians
Location of the course	21 (16%)	3 (13%)	9 (16%)
Frequency of the course offerings	35 (27%)	6 (26%)	8 (14%)
Time off from work to attend	21 (16%)	6 (26%)	16 (28%)
Financial support	23 (17%)	2 (9%)	10 (17%)
Administrative support	7 (5%)	4 (17%)	3 (5%)
Usefulness of the course	14 (11%)	1 (4%)	7 (12%)
Not required for my job	7 (5%)	1 (4%)	5 (9%)
Other	4 (3%)	0 (0%)	0 (0%)
Total	132	23	58

Region 3

	EMS	Nurses	Physicians
Location of the course	34 (16%)	15 (17%)	0 (0%)
Frequency of the course offerings	51 (24%)	13 (15%)	1 (11%)
Time off from work to attend	45 (22%)	24 (28%)	3 (33%)
Financial support	38 (18%)	17 (20%)	1 (11%)
Administrative support	16 (8%)	4 (5%)	0 (0%)
Usefulness of the course	17 (8%)	5 (6%)	1 (11%)
Not required for my job	3 (1%)	7 (8%)	3 (33%)
Other	5 (2%)	2 (2%)	0 (0%)
Total	209	87	9

Region 4

	EMS	Nurses	Physicians
Location of the course	36 (17%)	17 (10%)	4 (7%)
Frequency of the course offerings	45 (22%)	34 (19%)	9 (16%)
Time off from work to attend	51 (24%)	46 (26%)	20 (34%)
Financial support	43 (21%)	38 (21%)	7 (12%)
Administrative support	9 (4%)	12 (7%)	3 (5%)
Usefulness of the course	13 (6%)	11 (6%)	10 (17%)
Not required for my job	6 (3%)	15 (8%)	2 (3%)
Other	6 (3%)	4 (2%)	3 (5%)
Total	209	177	58

Region 5

	EMS	Nurses	Physicians
Location of the course	50 (17%)	3 (8%)	10 (23%)
Frequency of the course offerings	62 (22%)	11 (28%)	8 (19%)
Time off from work to attend	61 (24%)	7 (18%)	11 (26%)
Financial support	39 (21%)	9 (23%)	4 (9%)
Administrative support	12 (4%)	4 (10%)	0 (0%)
Usefulness of the course	27 (6%)	3 (8%)	7 (16%)
Not required for my job	13 (3%)	1 (3%)	2 (5%)
Other	7 (3%)	1 (3%)	1 (2%)
Total	271	39	43

Region 6

	EMS	Nurses	Physicians
Location of the course	19 (13%)	10 (8%)	8 (9%)
Frequency of the course offerings	40 (28%)	23 (28%)	11 (13%)
Time off from work to attend	37 (26%)	22 (18%)	27 (31%)
Financial support	23 (16%)	13 (23%)	11 (13%)
Administrative support	7 (5%)	3 (10%)	4 (5%)
Usefulness of the course	7 (5%)	4 (8%)	14 (16%)
Not required for my job	4 (3%)	8 (3%)	7 (8%)
Other	4 (3%)	2 (3%)	4 (5%)
Total	141	85	86

Region 7

	EMS	Nurses	Physicians
Location of the course	16 (23%)	6 (25%)	5 (16%)
Frequency of the course offerings	14 (20%)	8 (33%)	4 (13%)
Time off from work to attend	18 (26%)	4 (17%)	9 (29%)
Financial support	13 (19%)	4 (17%)	4 (13%)
Administrative support	5 (7%)	0 (0%)	1 (3%)
Usefulness of the course	1 (1%)	1 (4%)	4 (13%)
Not required for my job	0 (0%)	1 (4%)	4 (13%)
Other	2 (3%)	0 (0%)	0 (0%)
Total	69	24	31

Region 8

	EMS	Nurses	Physicians
Location of the course	29 (27%)	2 (9%)	5 (16%)
Frequency of the course offerings	27 (25%)	4 (18%)	6 (19%)
Time off from work to attend	22 (20%)	1 (5%)	9 (28%)
Financial support	16 (15%)	7 (32%)	3 (9%)
Administrative support	4 (4%)	4 (18%)	1 (3%)
Usefulness of the course	4 (4%)	0 (0%)	5 (16%)
Not required for my job	4 (4%)	4 (18%)	3 (9%)
Other	3 (3%)	0 (0%)	0 (0%)
Total	109	22	32

Appendix D: Washington Triage Procedure



State of Washington Prehospital Trauma Triage (Destination) Procedure

Purpose

The Trauma Triage Procedure was developed by the Centers for Disease Control in partnership with the American College of Surgeons, Committee on Trauma. The guidelines have been adopted by the Department of Health (DOH) based on the recommendation of the State EMS and Trauma Steering Committee.

The procedure is described in the attached algorithm. The guidelines represent the current best practice for the triage of trauma patients. The algorithm allows EMS and Trauma Responders to quickly and accurately determine if the patient is a major trauma patient. Major trauma patients must be taken to the highest appropriate level trauma facility in the defined system within 30 minutes transport time (Air or Ground).

The “defined system” is the trauma system that exists within an EMS and Trauma Care Region.

Explanation of Procedure

Any certified EMS and Trauma responder can identify a major trauma patient and activate the trauma system. This may include asking for Advanced Life Support response or air medical evacuation.

Step (1) Assess the patient’s vital signs and level of consciousness using the Glasgow Coma Scale.

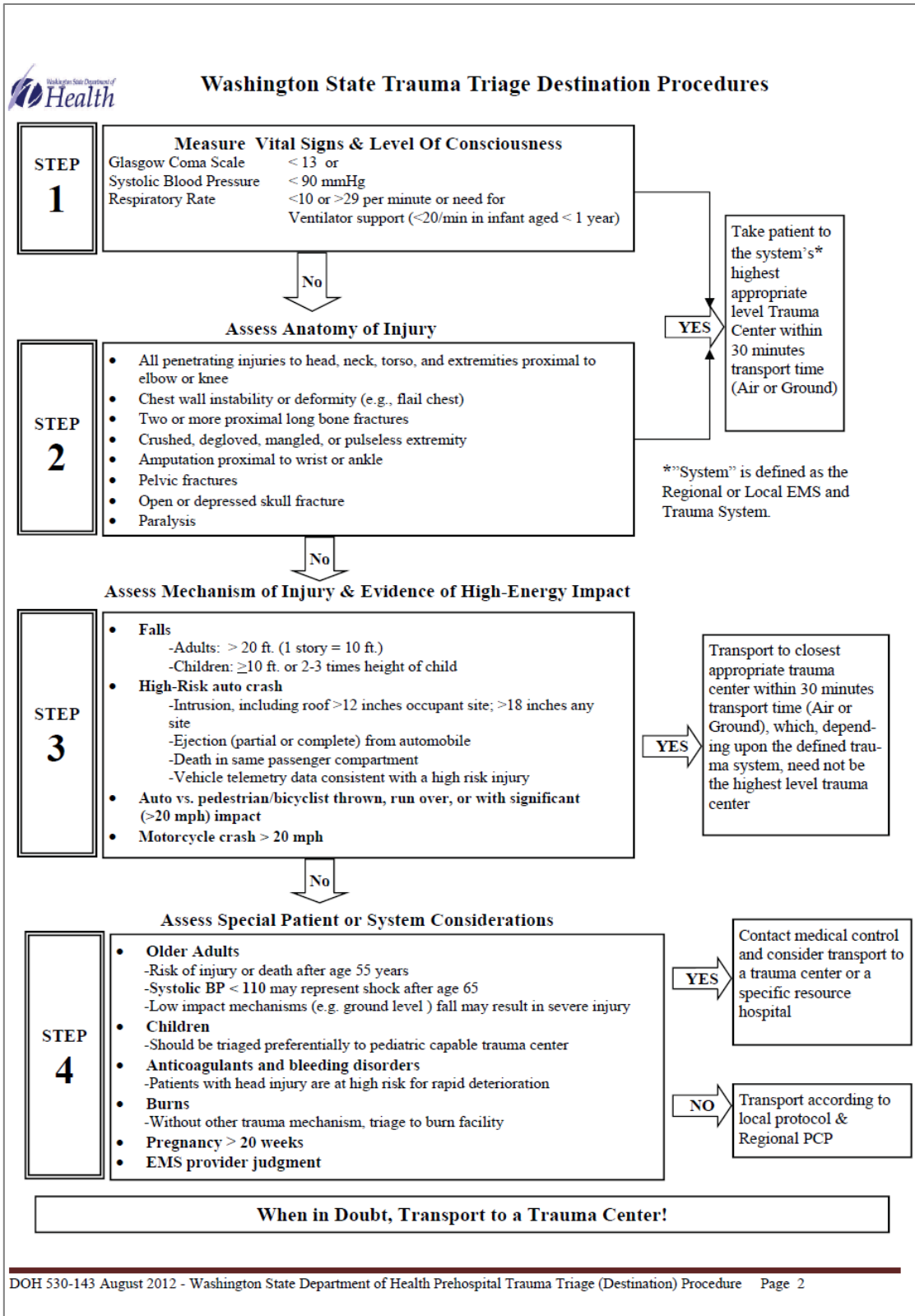
Step 1 findings require activation of the trauma system. They also require rapid transport to the highest, most appropriate trauma center within 30 minutes transport time (ground or air). If unable to manage the patient’s airway, consider meeting up with an ALS unit or transporting to the nearest facility capable of definitive airway management.

Step (2) Assess the anatomy of injury. Step 2 findings require activation of the trauma system. They also require rapid transport to the highest, most appropriate trauma center within 30 minutes transport time (ground or air). The presence of the specific anatomical injuries even with normal vital signs, lack of pain or normal levels of consciousness still require calling medical control and activating the trauma system.

Step (3) Assess biomechanics of the injury and address other risk factors. The conditions identified are reasons for the provider to transport to a trauma center. The destination trauma center need not be the highest level trauma center. Medical control should be contacted as soon as possible.

Step (4) has been added to assess special patients or system considerations. Risk factors coupled with “Provider Judgment” are reasons for the provider to contact Medical Control and discuss appropriate transport for these patients. In some cases, the decision may be to transport to the nearest trauma center.

Regional Patient Care Procedures (PCP’s) and Local County Operating Procedures (COPS) provide additional detail about the appropriate hospital destination. PCP’s and COP’s are intended to further define how the system operates. The Prehospital Trauma Triage procedure and the Regional Patient Care Procedures work in a “hand in glove” fashion to address trauma patient care needs.



Appendix E: State Trauma Program Websites

State	Trauma Program Websites ²⁷
Alabama	Department of Public Health https://www.alabamapublichealth.gov/aths/trauma-centers.html
Alaska	Department of Health and Social Services http://dhss.alaska.gov/dph/Emergency/Pages/trauma/default.aspx
Arkansas	Department of Health https://www.healthy.arkansas.gov/programs-services/topics/designated-trauma-centers
Arizona	Department of Health Services https://www.azdhs.gov/preparedness/emergency-medical-services-trauma-system/index.php
California	Emergency Medical Services Authority https://emsa.ca.gov/Trauma/
Colorado	Department of Public Health and Environment https://www.colorado.gov/pacific/cdphe/categories/services-and-information/health/emergency-care/trauma-system
Connecticut	State Committee on Trauma http://www.cttrauma.org/website/publish/home/homeList.php
Delaware	Delaware Health and Social Services https://dhss.delaware.gov/dph/ems/trauma.html
Florida	Department of Health http://www.floridahealth.gov/licensing-and-regulation/trauma-system/trauma-center-designation.html
Georgia	Georgia Trauma Foundation http://georgiatraumafoundation.org/
Hawaii	Department of Health https://health.hawaii.gov/injuryprevention/category/ipcs-core/state-trauma-program/
Idaho	Time Sensitive Emergency System https://tse.idaho.gov/
Iowa	Department of Public Health https://idph.iowa.gov/BETS/Trauma/resources
Illinois	Department of Public Health http://www.dph.illinois.gov/topics-services/emergency-preparedness-response/ems/trauma-program
Indiana	Department of Health https://www.in.gov/isdh/24972.htm

²⁷ URLs verified December 24, 2019.

Ohio Trauma Education and Certification

State	Trauma Program Websites ²⁷
Kansas	Department of Health and Environment http://www.kstrauma.org/
Kentucky	Kentucky Hospital Association https://www.kyha.com/kentucky-trauma-system
Louisiana	Louisiana Emergency Response Network http://lern.la.gov/trauma/trauma-education-resources/
Maine	Department of Public Safety https://www.maine.gov/ems/partners/trauma-system/hospitals.html
Maryland	TraumaNet https://www.maryland-traumanet.com/
Massachusetts	Department of Public Health https://www.mass.gov/trauma-centers
Michigan	Department of Health and Human Services https://www.michigan.gov/mdhhs/0,5885,7-339-73970_5093_28508---,00.html
Minnesota	Department of Health https://www.health.state.mn.us/facilities/traumasystem/
Mississippi	Department of Health https://msdh.ms.gov/msdhsite/_static/49.html
Missouri	Department of Health and Senior Services https://health.mo.gov/living/healthcondiseases/chronic/tcdsystem/designatedhospitals.php
Montana	Department of Public Health and Safety https://dphhs.mt.gov/publichealth/emsts
Nebraska	Department of Health and Human Services http://dhhs.ne.gov/Pages/EHS-Statewide-Trauma-System-of-Care.aspx
Nevada	Department of Health and Human Services http://dpbh.nv.gov/Programs/NVTrauma/NVTrauma_-_Home/
New Hampshire	Department of Safety https://www.nh.gov/safety/divisions/fstems/ems/trauma/index.html
New Jersey	Department of Human Services https://www.nj.gov/humanservices/dmhas/initiatives/trauma/
New Mexico	Department of Health https://nmhealth.org/about/erd/emsb/trauma/
New York	Department of Health https://www.health.ny.gov/professionals/ems/state_trauma/
North Carolina	Department of Health and Human Services https://info.ncdhhs.gov/dhsr/EMS/trauma/index.html
North Dakota	Department of Health https://www.health.nd.gov/epr/emergency-medical-systems/trauma-system/trauma_training-opportunities/
Ohio	Department of Public Safety https://www.ems.ohio.gov/trauma-system.aspx
Oklahoma	Department of Health https://www.ok.gov/health/Protective_Health/Emergency_Systems/Trauma_Division/index.html

Ohio Trauma Education and Certification

State	Trauma Program Websites ²⁷
Oregon	Oregon Health Authority https://www.oregon.gov/oha/HSD/AMH/Pages/Trauma.aspx
Pennsylvania	Pennsylvania Trauma Systems Foundation http://ptsf.org/our-trauma-centers/trauma-centers
Rhode Island	Department of Health http://health.ri.gov/programs/detail.php?pgm_id=128
South Carolina	Department of Health and Environmental Control https://www.scdhec.gov/health-professionals/sc-trauma-system
South Dakota	Department of Health http://doh.sd.gov/providers/ruralhealth/trauma/
Tennessee	Department of Health https://www.tn.gov/health/health-program-areas/health-professional-boards/ems-board/ems-board/trauma.html
Texas	Department of State Health Services https://www.dshs.texas.gov/emstraumasystems/etrahosp.shtm
Utah	Bureau of Emergency Medical Services and Preparedness https://bemsp.utah.gov/operations-and-response/ems-operations/
Vermont	Department of Health https://www.healthvermont.gov/emergency/injury
Virginia	Department of Health http://www.vdh.virginia.gov/emergency-medical-services/trauma-critical-care/virginia-trauma-centers/
Washington	Department of Health https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/EmergencyMedicalServicesEMSSystems/EMSandTrauma
West Virginia	Department of Health and Human Resources https://www.wvoems.org/designation-and-categorization/trauma-designation
Wisconsin	Department of Health Services https://www.dhs.wisconsin.gov/trauma/index.htm
Wyoming	Department of Health https://health.wyo.gov/publichealth/ems/wyoming-trauma-program/

This page intentionally left blank.