

Assessment of Factors Associated with the Delayed Transfer of Pediatric Trauma Patients: An EMS and Emergency Physician Survey

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We would like to acknowledge the participation of all of the hospitals and EMS providers that refer patients to our institution and their interest and willingness to help us continue to improve the care of injured children,

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Introduction

Children represent a special challenge for emergency care providers. These challenges can result in delayed recognition of children in distress and therefore delay definitive treatment or appropriate transfer. Despite the fact that within the state of Ohio there are six pediatric trauma centers, the vast majority of ED visits made by children are to general hospitals which are less likely to have pediatric expertise, equipment, and policies in place. Given that injury remains the leading killer of children and that care provided at trauma centers has been shown to improve outcomes, it is essential that seriously injured children are quickly and appropriately evaluated and transferred to a designated trauma center for definitive diagnostic work up and care (Densmore, Lim, Oldham & Guice, 2006; MacKenzie et al., 2006).

Given the demonstrated delays in the transfer of injured children to pediatric trauma centers and the known limitations that exist for many pre-hospital and ED providers in caring for children, this study will help to clarify the existing trauma system, knowledge, and resource barriers impacting the rapid and appropriate transfer of injured children to designated trauma centers in the State of Ohio. Our innovative approach utilized surveys targeted to EMS providers and emergency medicine physicians to directly assess barriers currently impacting the care of injured children in our state. The surveys specifically addressed relevant EMS-C performance measures, knowledge of relevant trauma triage guidelines and recommendations for pre-transfer imaging, pediatric and trauma specific training and perceived barriers to patient transfer. Once the barriers are more clearly delineated within our state, directed training and system changes can be put into place. In addition, the findings from this study will further define a baseline of our current status to allow future tracking of improvements.

Background

Despite the importance of quick and appropriate transfer, we have previously identified that 82% of patients transferred to our Level I pediatric trauma center arrived well beyond the state two hour goal (average 420 minutes). Unfortunately these delays were not isolated among those children with minor injuries; 79% of those with overall severe injuries (Injury Severity Score (ISS) >15) and 47% of those with severe traumatic brain injuries (Glasgow Coma Score (GCS)<9) arrived beyond the two hour goal. When we investigated the etiology of these delays there were no observed differences related to individual hospitals, distance from our institution or mode of transport (air vs. ground). Delays were however more common among those with commercial insurance (75.8% vs. 64.8%; $p<0.05$) and those that had a CT scan prior to transfer (52.1% vs. 23.3%; $p<0.05$). In this prior ODPS funded study we were unable to demonstrate an association with imaging and any specific clinical findings and were therefore uncertain as to the reason providers felt the need to image prior to transfer (Chatoorgoon et al., 2010).

Other work has demonstrated that not only may excess imaging be associated with delays but that these children may require repeat imaging secondary to poor quality or unavailability of initial imaging exposing them to increased radiation risk and increased cost (Chwals et al., 2008). In addition, the reasons for obtaining imaging prior to transfer in a study of adult trauma patients revealed numerous misconceptions ranging from legal requirements, trauma center expectations, and fear of litigation as reasons to delay transfer to obtain imaging (Lee et al., 2008). Until we fully understand the reasons these providers are obtaining imaging prior to patient transfer we will be unable to properly educate and reduce this unnecessary practice.

According to the Institute of Medicine report, *Emergency Care for Children: Growing Pains* (Institute of Medicine [IOM], 2007) although children represent 27% of all ED visits, many hospitals are not adequately prepared to handle pediatric patients. The problems identified in this report include lack of transfer agreements and clear transfer guidelines for pediatric patients, limited and varied pediatric training and experience, lack of a designated pediatric emergency coordinator, failure to use evidence based approaches to provide care and reduce errors, and failure to explore and utilize new technologies to improve the care and rapid appropriate triage of pediatric patients. In addition to delays at outside hospitals, it has been noted that pre-hospital providers may not always bring pediatric trauma victims directly to an appropriate pediatric trauma center; the reasons for these “choices” are not clear. Given these demonstrated limitations, many dedicated well intentioned pre-hospital and ED providers often make do without the specialized pediatric training and resources that are present in pediatric trauma centers.

Methods

Survey development and distribution

Surveys were designed by a multi-disciplinary group including an Emergency Department (ED) physician, an Emergency Medical Services (EMS) provider, a pediatric trauma surgeon and an education specialist. Two surveys were developed, one designed for EMS providers and one for ED physicians. Both were created to help understand knowledge and system issues impacting the prompt identification and transfer of injured children to an appropriate pediatric trauma facility. Both surveys contained questions to obtain general demographic information as well as two case studies with questions, one scenario meeting the State of Ohio defined trauma criteria and another case study that did not definitely meet criteria but was subject to discussion. All surveys allowed participants to enter their answers in either an open-ended or multiple choice fashion (**Appendix 1**).

Utilizing a list of EMS providers provided by the State of Ohio Department of Public Safety and a list of ED physicians from Ohio, provided by the American College of Emergency Physicians (ACEP), individuals were randomly selected to receive the survey and a total of 958 EMS surveys and 936 physician surveys were mailed. The survey was open to all EMS and emergency physician providers who

treat injured children. Exclusion criteria included EMS providers who did not practice in the field and ED physicians currently working in pediatric trauma centers (PTC). The surveys were initially mailed in April of 2010 along with a cover letter introducing the study and requesting the participant to forward the provided SurveyMonkey website link (www.surveymonkey.com) to other peers to complete online. To further incentivize participation a five dollar gift card was included. A follow up letter was sent one month after the initial letters to further encourage participation. Surveys, both hard copy and electronic were accepted until June 30, 2010.

Results

EMS providers

In summary, a total of 825 EMS surveys were completed; 239 via mail and 586 online. There were 89 surveys excluded, 72 submitted with no responses and 17 not practicing in the field leaving a total of 736 surveys available for further analysis.

The majority of responders were paramedics (68%), worked full-time (66%), and were in a 911 service area (94%) (**Table 1**). In addition, 41% were from rural areas in the state and 47% were within 20 miles of the closest pediatric trauma center. Not surprisingly, pediatric experience among these providers was limited with 47% treating 10 or fewer pediatric patients a year, with the majority of providers having no pediatric intubation (65%) or intraosseous line placement (57%) experience in the past year (**Table 2**).

Despite the fact that scenario one was designed to clearly meet state trauma criteria and scenario two was not, 84% and 86% of providers answered that they would transport the patients to a pediatric trauma center. In scenario #1, a motor vehicle collision with a child that had abdominal bruising and pain, 93% of providers included mechanism of injury as the reason for transport to a PTC. Despite the fact that abdominal bruising and pain is a state trauma criterion, only 38% listed the pain and bruising and only 43% of respondents listed state trauma criterion as a reason for transfer to a trauma center (**Figure 1**). In scenario #2, a multi-vehicle collision with a death of the driver and an otherwise stable child, the main reason providers indicated they would transfer to a PTC was death of another passenger in the same vehicle (89.0%) (**Figure 2**). The mechanism of injury and amount of damage to the car, neither of which are State of Ohio trauma criteria were also listed as top reasons to indicate the need to transport directly to a trauma center. Fifty percent also incorrectly responded that this patient met state trauma criteria.

The location, rural, urban or suburban of the EMS provider did not impact the likelihood of transferring either patient (**Figure 3**). Among the providers that would transport the patient from scenario 1 or 2, 16% and 21% respectively, within 20 miles of a PTC would call for air transport (**Figure 4** and **Figure 5**). In addition, 62% would bypass an adult trauma center to transport to a PTC. It was observed that for those responding that they would bypass an adult center, transfer time to a PTC was 25 minutes compared to an average transport time of 34 minutes for those that would not bypass the adult center ($p < 0.05$).

For scenario 1 and 2, 16% and 14% respectively, of respondents either were not sure or would not transport the patient directly to a PTC. The reasons provided for not transporting the patient to a PTC are shown in **Figure 6**. The primary reasons provided were that the PTC was too far away and that they would transfer to the closest community hospital. Accordingly, more than 90% of EMS providers who answered they would not transport because of distance were beyond 20 miles away from a PTC, with 49% for scenario #1 and 59% for scenario 2 being more than 40 miles away. Interestingly, only 32% and 23% considered traffic during rush hour as an important factor in scenario #1 and #2. Average transport time of those who would transport to a PTC was significantly different than for those who would not (28 minutes vs. 43 minutes, $p < 0.05$). Just under half of those that would not initially transfer to a PTC would reconsider if there was tachycardia, hypotension, altered mental status, or an open fracture (**Figure 7**). Among those that would transfer either patient to a community hospital 83% either were unsure or knew there was not pediatric expertise at that institution. Furthermore, 21% of the EMS providers that would not transport to a PTC responded that there is never a reason to bypass the closest community hospital. Even among those that would not transport to a PTC, 73% correctly identified the patient in scenario 1 as meeting state trauma criteria, and 66% for scenario 2 incorrectly categorized the patient as meeting state trauma criteria.

ED physicians

A total of 486 ED physician surveys were returned: 384 via mail and 102 completed online. There were 107 surveys excluded because the participant was currently practicing in a PTC leaving a total of 377 surveys for further analysis.

Over 80% of respondents were residency trained in emergency medicine with less than 1% having fellowship training in pediatric emergency medicine (**Table 3**). Although 54% of respondents report treating over 200 pediatric patients a year, the majority had performed less than 5 intubations (93%), intraosseous line placement (99%), central line placement (99%), or chest tube placement (100%) (**Table 4**). Only 37% of respondents reported that their institution had an on call surgeon 24 hours a day.

For the first scenario, a child thrown from a dirt bike complaining of facial pain, 90% of the ED physicians correctly identified the patient as a trauma patient according to the State of Ohio definition and 74% would appropriately transfer to a PTC. Although the second scenario, a four year old that fell 5 feet with an upper extremity fracture, does not meet state trauma criteria, 46% of respondents classified this child as a trauma patient and 34% would transfer to a PTC.

ED physicians that would transfer either child, were asked if they would perform diagnostic studies and why prior the transfer. Less than 20% of respondents for the first scenario would do no diagnostic studies and 3% would do only a chest x-ray prior to transfer. For the first scenario, 56% would perform a head computed tomography (CT) prior to transfer (**Figure 8**). In scenario two, many fewer practitioners obtained imaging, other than an extremity film, but there were still nearly 33% that would

have obtained additional imaging. The primary reason provided for obtaining diagnostic studies prior to transfer were to avoid missed injuries, followed by legal concerns (**Figure 9**).

For those providers that would transfer either child the mode of transport is demonstrated in **Figure 10**. For the group that responded that they would transport via helicopter, 46% were greater than 20 miles from the PTC, among those greater than 50 miles from a PTC this percentage increased to 60%.

Among those that would not transfer either patient, 27% do not have 24 hour on-call surgeon coverage. In addition, the majority (69.6%) were from institutions less than 20 miles away from a PTC. Among those providers that would transfer the child in each scenario, 45% and 53% (scenario 1 and 2) work at an adult trauma center and 52% and 41% treat over 200 pediatric patients a year (**Table 5** and **Table 6**).

The ED physicians who would not transfer the patients were asked which additional findings would prompt them to transfer the child to a PTC (**Figure 11**). For the less severely injured child in scenario 2, ED physicians would transfer at a much higher rate if there were changes in the clinical status compared to those that would change their plan to not transfer the more severely injured child from scenario 1.

Discussion

Despite the existence of a trauma system in the State of Ohio it has previously been demonstrated both on a state and local level that greater than 80% of injured patients do not reach an appropriate trauma center within the state goal of 2 hours. Although the etiology of these delays is unclear it has previously been shown that they are associated with excess imaging prior to transfer. This study of over 700 EMS providers and nearly 500 EM physicians across the state adds to our understanding of such delays (**Figure 12**). First, we have demonstrated that both in the pre-hospital and initial hospital phase of care there is an under appreciation of the state trauma criteria and the value of a pediatric trauma center. In addition, in some cases the pre-hospital phase decision not to transfer to a pediatric trauma appears to be associated with the distance to the nearest pediatric trauma center. Meanwhile at the initial hospital many patients receive diagnostic testing prior to transfer for reasons that do not comply with Advanced Trauma Life Support (ATLS) protocols such as the need to avoid missing any injuries or for medico-legal concerns.

EMS providers face multiple challenges in the field when dealing with an injured pediatric patient, most importantly low levels of experience as demonstrated here. As a consequence, the ability to clearly apply the state trauma triage criteria to children appears to be somewhat limited and therefore may contribute to both over and under triage of children. For example, in scenario 1 a child who met trauma criteria because of abdominal bruising and pain was correctly taken to a trauma center by the majority of providers despite few actually identifying this patient as meeting state criteria or reporting that the clinical findings were important in their decision to transfer. Interestingly for both this scenario, as well as the

second scenario which included a clinically stable child involved in a MVC with a death at the scene, mechanism of injury and not the child's exam and vitals were utilized in determining the need for transfer directly to a pediatric trauma center. Mechanism of injury as an isolated triage criterion has not been found to be useful in indicating the need for a trauma resuscitation and rather clinical and physiologic parameters are much more indicative of the need for trauma care (Nuss, Dietrich & Smith, 2001; Kohn, Hammel, Bretz & Stangby, 2004; Cooper, Yarbrough, Zone-Smith, Byrne & Norcross, 1995). Therefore, although the correct decision to transfer was reached by most providers in the first scenario, ongoing education emphasizing the clinical and physiologic parameters outlined in the state's trauma triage criteria is necessary. For scenario two, although if readily accessible the transfer of this child to a pediatric trauma center is reasonable, it is important to recognize and appropriately utilize limited resources so as to ensure the children in most need are promptly transferred and evaluated.

Transferring patients long distances and overutilizing air transport services for scene transports has the potential to overburden the system as well as negatively impact patient safety. Analysis of the survey results interestingly demonstrate that rural providers are just as likely to transfer a child directly to a pediatric trauma center as are their urban and suburban counterparts. It was however noted that clearly, and often appropriately, distance from the pediatric trauma center was indeed a factor in making a decision to transport a child directly to a pediatric trauma center. Of those who would not transfer directly to a pediatric trauma center the majority were greater than 20 miles from the closest pediatric trauma center and on average transport time would be 45 minutes compared to just under 30 minutes for those that would transport directly. This time frame is appropriate given the current trauma triage guidelines which recommend transports not be longer than 30 minutes, although, given the previously noted extensive delays once arriving at a non-trauma center, the 15 minute additional transfer time may actually be in the child's best interest. For those EMS providers that are further from a pediatric trauma center it is important that as a state we continue to develop an inclusive trauma system to encourage the verification of additional level 3 centers that are committed to the prompt and appropriate treatment and transfer of injured children (Haller, 2002; Sampalis, et al., 1999; Hulka et al., 1997).

In addition, although there is continued debate regarding the distance beyond which air transport is of value, most would agree that a distance of less than 20 miles is generally a contraindication to air transport (Thomas, 2007.; Biewener, Aschenbrenner, Rammelt, Grass & Zwipp, 2004). Despite this, nearly 20% of responding EMS providers reported that they would request air transport even though they were less than 20 miles from the closest pediatric trauma center. Development of clear guidelines to support appropriate use of air transport will likely help ensure that the patients that will benefit most for this mode of transport receive it consistently.

Although the majority of the reasons given to not transfer either patient were related to distance from the pediatric trauma center there were some interesting and somewhat concerning observations. First, nearly 20% of respondents that said they would not transfer one or both of the patients reported that

there was “never” a reason to not go to the community hospital first. With the availability of air transport throughout the state and the number of pediatric trauma centers the frequency of this response is concerning and may imply a lack of knowledge regarding the benefits of children being cared for at a pediatric trauma center (Potoka, Schall & Gardner, 2000; Densmore et al., 2006; Hall, Reyes & Meller, 1996; Nakayama, Copes & Sacco, 1992). Second, it is interesting that although EMS providers reported that they would take a child to the nearest community hospital rather than directly to a pediatric trauma center, 80% were unaware of whether that hospital had any pediatric expertise or experience. This again indicates a lack of awareness of the value of children being cared for by those with expertise and experience in managing their unique physiology.

The level of experience of ED providers who are not part of a pediatric trauma center in managing severely injured children has been reported to be quite low (IOM, 2006; Gausche-Hill, Schmitz & Lewis, 2007). The results of this survey of Ohio ED providers confirms this deficiency with over 90% of respondents reporting having performed 5 or fewer critical procedures essential in the care of critically injured children. In addition the majority of these providers are functioning in hospitals that do not have 24 hour 7 day a week coverage by a general surgeon.

Although 90% of providers appropriately recognized the patient in scenario one, a child thrown from a dirt bike complaining of facial pain, as meeting trauma criteria, only 74% would transfer the patient to a pediatric trauma center. In addition, although the patient in the second scenario, a child with a fractured extremity following a low fall, did not meet state criteria, 46% felt it was a trauma and only 34% would transfer. These results suggest that although the majority of providers understand the appropriate criteria for identifying a pediatric trauma patient, not all providers recognize the benefit of transferring that child to a pediatric trauma center. Our data suggests that those working at an adult trauma center or who see more than 200 pediatric patients a year are less likely to transfer either patient. Although this may relate to an overall “comfort” level in dealing with trauma and/or children, available data continues to support that the pediatric trauma patient will have improved outcomes by having their care at a pediatric trauma center. This improved care is not only the result of the pediatric trauma team’s initial care but perhaps even more importantly on the developmentally appropriate care throughout recovery (Potoka, Schall & Ford, 2001).

Among those that did respond that they would transfer either pediatric trauma patient to the closest pediatric trauma center, only 20% would not do any imaging prior to transfer and only 3% would limit their diagnostic imaging to a CXR only. According to ATLS guidelines, initial management should be focused on stabilization, treatment of immediately life threatening injuries and transfer to a definitive care facility, namely an appropriate trauma center. Secondary, or adjunct imaging, should be performed only if it will not delay transfer or there is an appropriately trained provider that can manage the potential injuries identified. For the child in the first scenario, over 50% would perform a head CT prior to transfer to a pediatric trauma center. In addition, for the less severely injured child in scenario 2, over 30% would

perform additional imaging prior to transfer if they chose to transfer this child. As has been previously demonstrated this unnecessary imaging has been associated with delayed transfers and the need to repeat imaging because of poor quality or initial imaging is not available for review (Chatoorgoon et al., 2010; Chwals et al., 2008). In addition to the potential impact on cost, radiation exposure and delay of transfer, imaging without an available specialist (only 37% of respondents had a general surgeon available and likely even fewer had a neurosurgeon comfortable in managing pediatric trauma available) is in direct contradiction to the recommendations of ATLS guidelines.

Interestingly, when the reasons for obtaining such imaging were examined, the majority of respondents reported they were done to avoid missed injuries and for medico-legal reasons. Again although identifying immediately life threatening injuries that can be rapidly treated at the facility is part of ATLS, there is no need to identify all injuries prior to transfer. There is also no need to have definitively diagnosed all injuries prior to transfer from a medico-legal standpoint prior to transfer (Lee et al., 2008; Emergency Medical Treatment and Active Labor Act [EMTALA], 2000). Additionally, many of the other reasons given for performing additional diagnostic tests prior to transfer such as parent expectation, “routine”, and the perceived expectation of the trauma center should all be considered as not being in the best interest of the child.

Conclusions and Recommendations

This study, although limited in that it is a survey study and does not necessarily reflect actual practice, demonstrates several opportunities for improvement of the level of care provided to pediatric trauma patients in the State of Ohio. First, both EMS providers as well as ED physicians across the state may benefit from a more complete understanding of the current trauma triage criteria. As part of understanding the criteria and utilizing them to direct the appropriate patients to a pediatric trauma center it is incumbent upon pediatric trauma centers to continually educate providers and demonstrate with transparent risk adjusted outcomes the important benefits of having children cared for at designated trauma centers. In addition it is critical that triage criteria at all levels, pre-hospital and community hospital, as well as at the pediatric trauma centers themselves is strongly based in evidence that helps ensure the right patient gets to the right place at the right time and has access to the most appropriate resources.

Second this survey study further supports prior observations that providers have limited pediatric experience which has been associated with lower quality of care for children. In order to combat this limitation it is important that unique and readily available education and training opportunities exist. One such approach is the use of high fidelity simulation to train providers in the management of high risk but low frequency events. This method has been demonstrated to be useful in the training of trauma teams as well as numerous health care teams (Falcone et al., 2008; Patterson, Geis & Wears, 2006a). A limitation of simulation training is that it may be difficult for providers in communities at a distance from a simulation center to obtain such training. One potential innovative approach may be to offer simulation

training utilizing distance teleconferencing technology. Finally, the use of telemedicine to “virtually” assist in the management of severely injured children in the field or in the emergency departments of non-pediatric centers may enhance the immediate care of these patients (Marcin, Schepps, Page, Struve, Nagrampa & Dimand, 2004).

Third, given that distance from a pediatric trauma center was identified as an important issue for providers not transporting to a pediatric trauma center it will be important to develop the state’s trauma system to ensure that these children receive timely and high quality care at the first institution they are brought to. This can most likely be achieved not only through the type of education and telemedicine approaches described above but also by supporting and encouraging the development of more level 3 trauma centers as well as a more efficient and appropriate utilization of air transport.

Finally, the challenge of excessive imaging of pediatric patients prior to transfer to definitive care remains a vexing problem. Not only will directed education be important to combat this problem but also expansion of the evidence base describing the deleterious impact of such imaging including increased radiation exposure, increased costs, and delay in care which ultimately may impact outcome.

Information/Qualifications – Principal and all co-investigators

The principal investigator, **Richard A. Falcone, Jr., M.D., M.P.H.**, is currently the Director of the Trauma Services Program within the Division of Pediatric and Thoracic Surgery at Cincinnati Children’s Hospital Medical Center. He is also the Chair of the Trauma Performance Improvement Committee. He has an extensive background in trauma research including epidemiologic studies, quality of care studies and design and evaluation of injury prevention programs and has published over 50 peer reviewed articles. He has been funded by the ODPS for several previous projects as well as an ongoing multicenter project.

Marianne Beaudin, M.D., M.Sc., F.R.C.S.C. is currently the Pediatric Trauma Fellow at Cincinnati Children’s. Dr. Beaudin has a background in both basic science and clinical research including design and evaluation of head injury guidelines and trauma epidemiologic studies. Her clinical research has resulted in several peer reviewed articles, oral and poster presentations.

Margot Daugherty, R.N., M.S.N., M.Ed., is currently the trauma nurse educator at Cincinnati Children’s. Ms. Daugherty has extensive experience in both adult and pediatric trauma program management and pre-hospital care. She is actively involved in teaching health care providers at all levels how to care for injured patients with an emphasis on pediatric patients. She is an ATLS course coordinator as well as TNCC instructor.

Gary Geis, M.D. is a fellowship trained pediatric emergency medicine physician and emergency medicine liaison to the Trauma Services Program at Cincinnati Children's. He is also the assistant medical director of the Cincinnati Children's Center for Simulation and Research and is intimately involved in resident and fellowship education. Dr. Geis has been funded by AHRQ as a co-investigator for his work in simulation and has numerous peer reviewed publications.

Suzanne Moody, M.P.A., is the Clinical Research Coordinator in the Trauma Services Program at Cincinnati Children's and has extensive experience in trauma data management, project organization and data analysis.

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Table 1: EMS Survey Demographics

Certification Level (n=713)	n	%
EMT-Paramedic	485	68.0%
EMT-Intermediate	65	9.1%
EMT-Basic	163	22.9%
Practice Status (n=734)	n	%
Full-time EMS Only	92	12.5%
Part-time EMS Only	27	3.7%
Volunteer EMS Only	61	8.3%
Full-time Firefighter/EMS	289	39.4%
Part-time Firefighter/EMS	73	9.9%
Volunteer Firefighter/EMS	73	9.9%
Full-time EMS Officer/Supervisor	104	14.2%
Part-time EMS Officer/Supervisor	15	2.0%
Employer a 911-Responder Service (n=734)	n	%
Yes	692	94.3
No	42	5.7
Primary Employer Service (n=732)	n	%
Rural	303	41.4%
Urban	132	18.0%
Suburban	297	40.6%
Distance to closest pediatric trauma center (n=736)	n	%
1 -10 miles	140	19.0%
11-20 miles	206	28.0%
21-30 miles	135	18.3%
31- 40 miles	81	11.0%
41-50 miles	76	10.3%
Over 51 miles	98	13.3%
Distance to closest adult trauma center (n=736)	n	%
1 -10 miles	230	31.3%
11-20 miles	213	28.9%
21-30 miles	108	14.7%
31- 40 miles	75	10.2%
41-50 miles	66	9.0%
Over 51 miles	44	6.0%
Distance to closest community hospital (n=733)	n	%
1 -10 miles	527	71.9%
11-20 miles	184	25.1%
21-30 miles	16	2.2%
31- 40 miles	4	0.5%
41-50 miles	2	0.3%
Over 51 miles	0	0.0%

Table 2: EMS Survey - Pediatric Experience

	EMT-Paramedic		EMT-Intermediate		EMT-Basic			
Annual # of CEU's	11.35		8.45		9.36			
# of Pediatric Patients Treated Annually	EMT-Paramedic	%	EMT-Intermediate	%	EMT-Basic	%	Total	%
None	5	0.7%	0	0.0%	4	0.5%	9	1.2%
1-5	70	9.5%	14	1.9%	75	10.2%	159	21.6%
6-10	119	16.2%	29	3.9%	33	4.5%	181	24.6%
11-25	162	22.0%	15	2.0%	52	7.1%	229	31.2%
26-50	82	11.2%	3	0.4%	17	2.3%	102	13.9%
Over 50	45	6.1%	4	0.5%	6	0.8%	55	7.5%
# of Pediatric Intubations Conducted Annually	EMT-Paramedic	%	EMT-Intermediate	%	EMT-Basic	%	Total	%
None	278	37.9%	55	7.5%	163	22.2%	496	67.7%
1-5	199	27.1%	10	1.4%	22	3.0%	231	31.5%
6-10	2	0.3%	0	0.0%	2	0.3%	4	0.5%
11-15	1	0.1%	0	0.0%	0	0.0%	1	0.1%
Over 15	1	0.1%	0	0.0%	0	0.0%	1	0.1%
# of Pediatric intraosseous lines placed annually	EMT-Paramedic	%	EMT-Intermediate	%	EMT-Basic	%	Total	%
None	198	26.9%	53	7.2%	166	22.6%	417	56.7%
1-5	227	30.9%	12	1.6%	16	2.2%	255	34.7%
6-10	28	3.8%	0	0.0%	4	0.5%	32	4.4%
11-15	9	1.2%	0	0.0%	0	0.0%	9	1.2%
Over 15	21	2.9%	0	0.0%	1	0.1%	22	3.0%
# of Children Taken to Pediatric Trauma Center Annually	EMT-Paramedic	%	EMT-Intermediate	%	EMT-Basic	%	Total	%
Less than 5	206	34.7%	30	5.1%	91	15.3%	327	55.1%
5-15	105	17.7%	16	2.7%	44	7.4%	165	27.8%
16-30	53	8.9%	3	0.5%	8	1.3%	64	10.8%
Greater than 30	32	5.4%	2	0.3%	3	0.5%	37	6.2%

Table 3: Physician Survey - Demographics

Residency Trained in Emergency Medicine (n=375)	n	%
Yes	305	81.33%
No	70	18.67%
Fellowship Trained in Pediatric Emergency Medicine (n=377)		
Yes	3	0.80%
No	374	99.20%
	Range	Average
Years in Practice	0-50	13
Years in Practice in an Emergency Department	0-38	12.4
Employed Full-time in Emergency Department		
	n	%
Yes	310	82.23%
No	64	16.98%
Distance to closest pediatric trauma center (n=374)		
	n	%
1-10 miles	179	47.9%
11-20 miles	75	20.1%
21-30 miles	39	10.4%
31-40 miles	15	4.0%
41-50 miles	15	4.0%
over 51 miles	43	11.5%
Works at a pediatric trauma center	3	0.8%
Work in an adult trauma center (n=376)		
	n	%
Yes	183	48.67%
No	190	50.53%
Don't Know	3	0.80%

Table 4: Physician Survey - Pediatric Training & Experience

	Range	Average
Pediatric CME's obtained annually	0-100	11.3
Pediatric Patients Treated Annually (n=370)	n	%
None	17	4.6%
1-25	24	6.5%
26-50	24	6.5%
51-100	49	13.2%
101-200	56	15.1%
Over 201	200	54.1%
Pediatric intubation performed in last 12 months (n=370)	n	%
None	170	45.9%
1-5	176	47.6%
6-10	15	4.1%
11-15	6	1.6%
Over 15	3	0.8%
Intraosseous Lines placed on children under 10 in last 12 months (n=369)	n	%
None	220	59.6%
1-5	147	39.8%
6-10	3	0.8%
11-15	0	0.0%
Over 15	1	0.3%
Central lines placed in children less than 17 in last 12 months (n=370)	n	%
None	309	83.5%
1-5	56	15.1%
6-10	6	1.6%
11-15	1	0.3%
Over 15	0	0.0%
Chest tubes placed in children less than 17 in last 12 months (n=370)	n	%
None	336	90.8%
1-5	36	9.7%
6-10	0	0.0%
11-15	0	0.0%
Over 15	0	0.0%

Table 5: Physician Scenario 1.

	Physicians who would transfer patient to a pediatric trauma center (n=271)		Physicians who would NOT transfer patient to a pediatric trauma center (n=95)	
Still in Training	53	19.6%	16	16.8%
Residency Trained in EM	221	81.5%	75	78.9%
Fellowship Trained in Ped EM	3	1.1%	0	0.0%
Years in Practice (average)	13.2	Range = 0-50	12.6	Range = 0-39
Years Practice in ED (average)	12.7	Range = 0-37	12.3	Range = 0-38
Work Full-time in ED	226	83.4%	78	82.1%
Work in verified adult trauma center	123	45.4%	53	55.8%
Pediatric CME's obtained annually (average)	11.6	Range = 0-100	10.6	Range = 0-100
Pediatric patients treat annually				
None	7	2.6%	7	7.4%
1-25	16	5.9%	8	8.4%
26-50	20	7.4%	5	5.3%
51-100	38	14.0%	10	10.5%
101-200	50	18.5%	5	5.3%
Over 201	140	51.7%	58	61.1%
According to State of Ohio definition of trauma, would consider and treat this patient as a trauma patient	254	93.73%	75	78.95%

Table 6: Physician Scenario 2

	Physicians who would transfer patient to a pediatric trauma center (n=121)		Physicians who would NOT transfer patient to a pediatric trauma center (n=238)	
Still in Training	23	19.0%	42	17.6%
Residency Trained in EM	97	80.2%	197	82.8%
Fellowship Trained in Ped EM	2	1.7%	1	0.4%
Years in Practice (average)	13.6	Range = 0-46	12.8	Range = 0-50
Years Practice in ED (average)	12.9	Range = 0-37	12.6	Range = 0-38
Work Full-time in ED	97	80.2%	204	85.7%
Work in verified adult trauma center	64	52.9%	108	45.4%
Pediatric CME's obtained annually (average)	12.1	Range = 0-100	11.1	Range = 0-100
Pediatric patients treated annually				
None	4	3.3%	8	3.4%
1-25	13	10.7%	9	3.8%
26-50	14	11.6%	11	4.6%
51-100	16	13.2%	32	13.4%
101-200	24	19.8%	31	13.0%
Over 201	50	41.3%	145	60.9%
According to State of Ohio definition of trauma, would consider and treat this patient as a trauma patient	68	56.2%	98	41.2%

Figure 1.

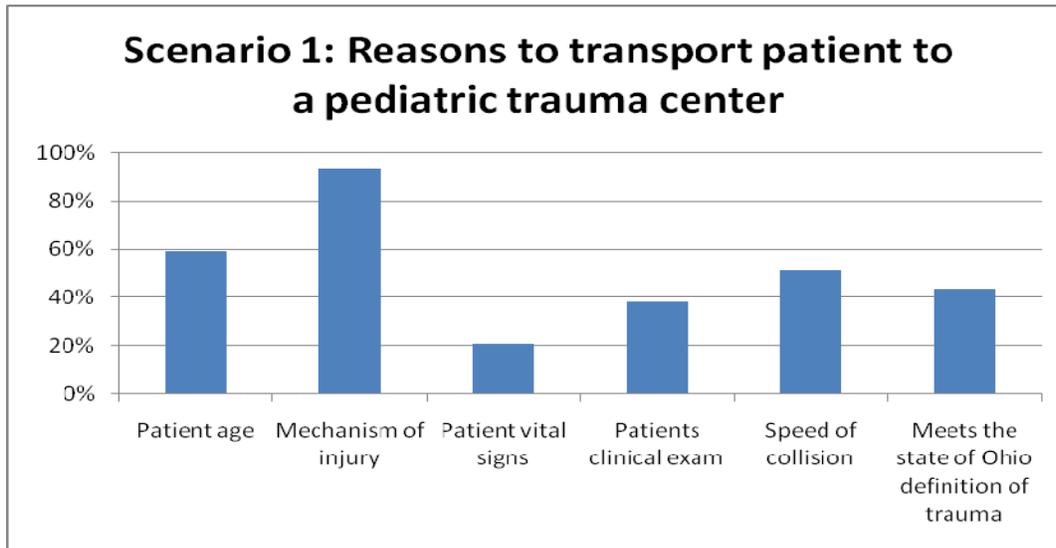


Figure 2.

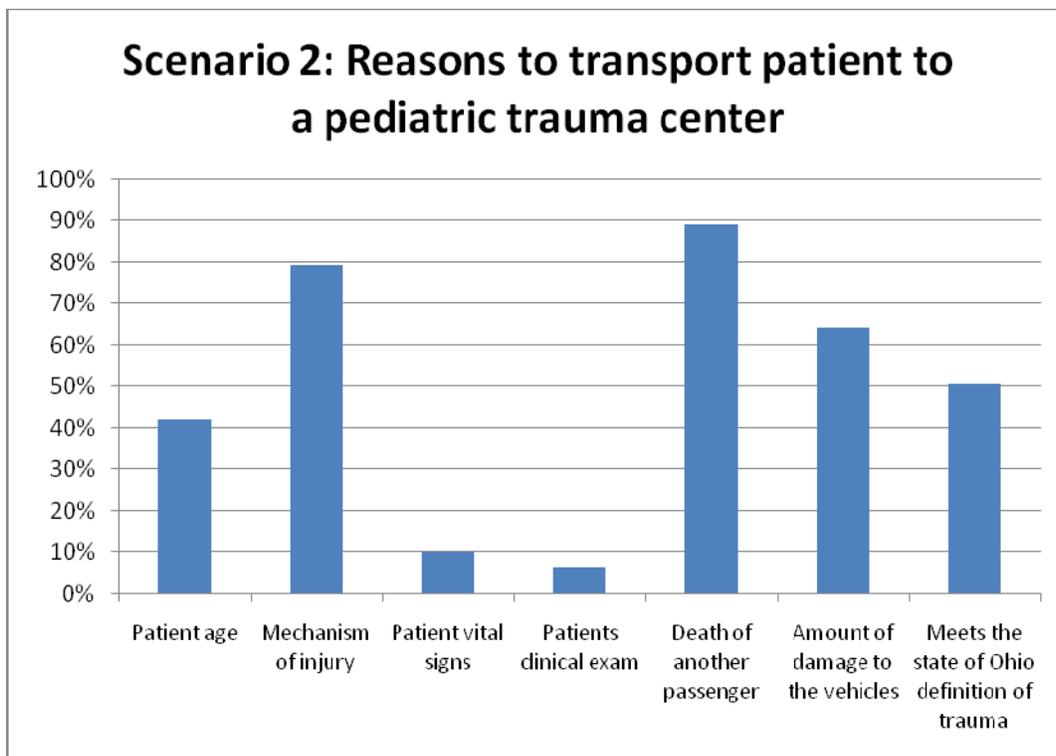


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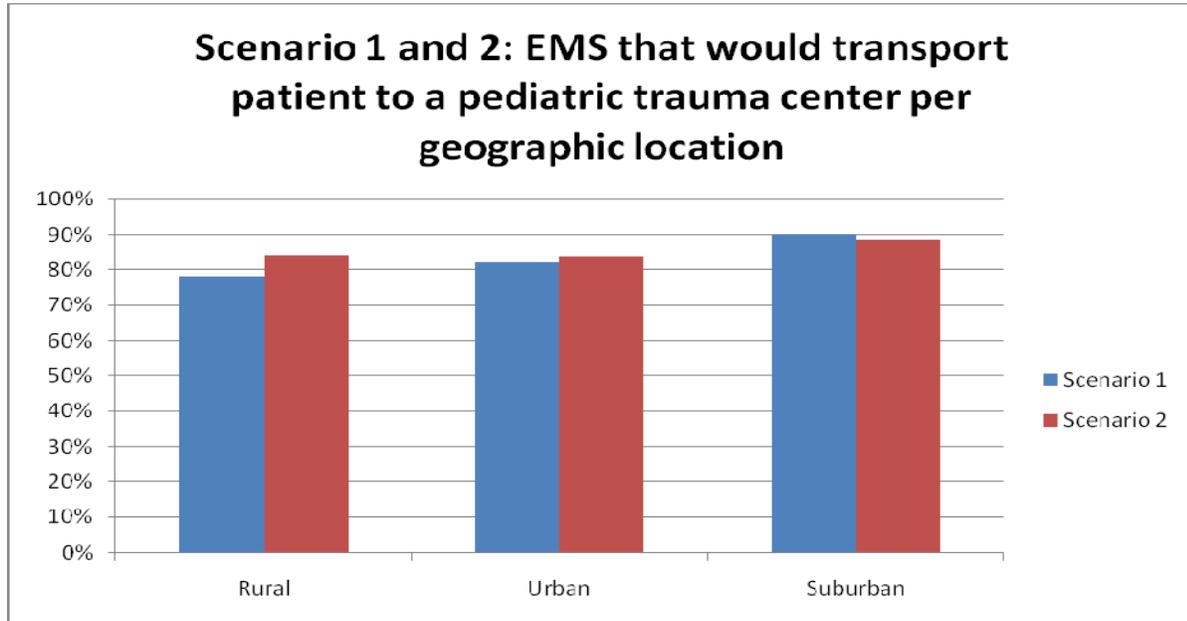


Figure 4.

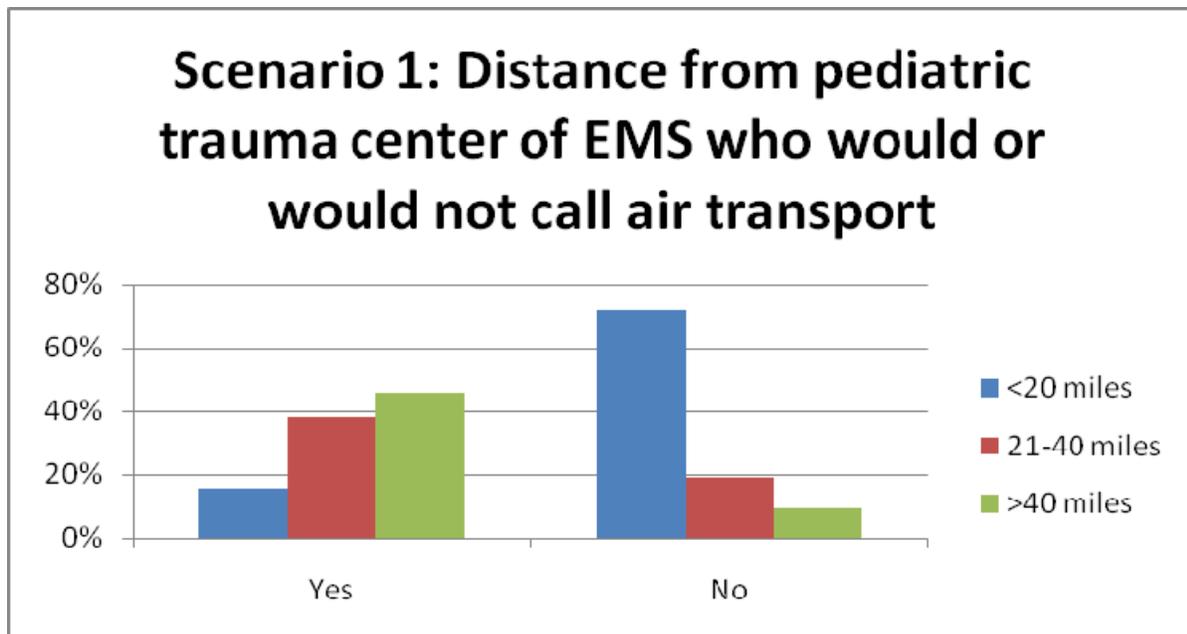


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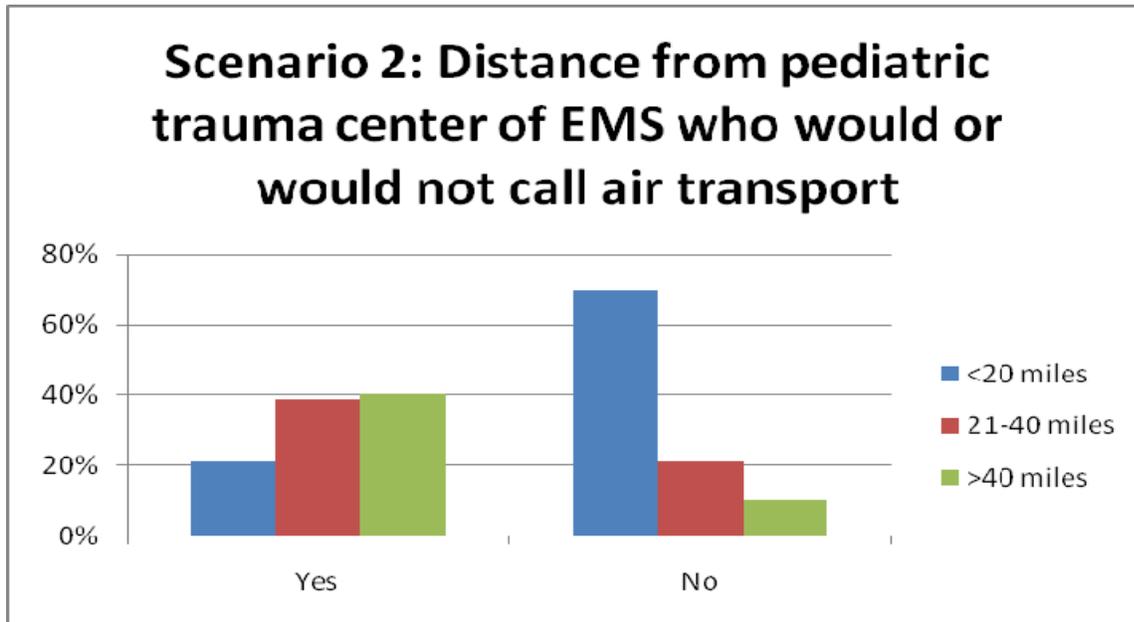


Figure 6.

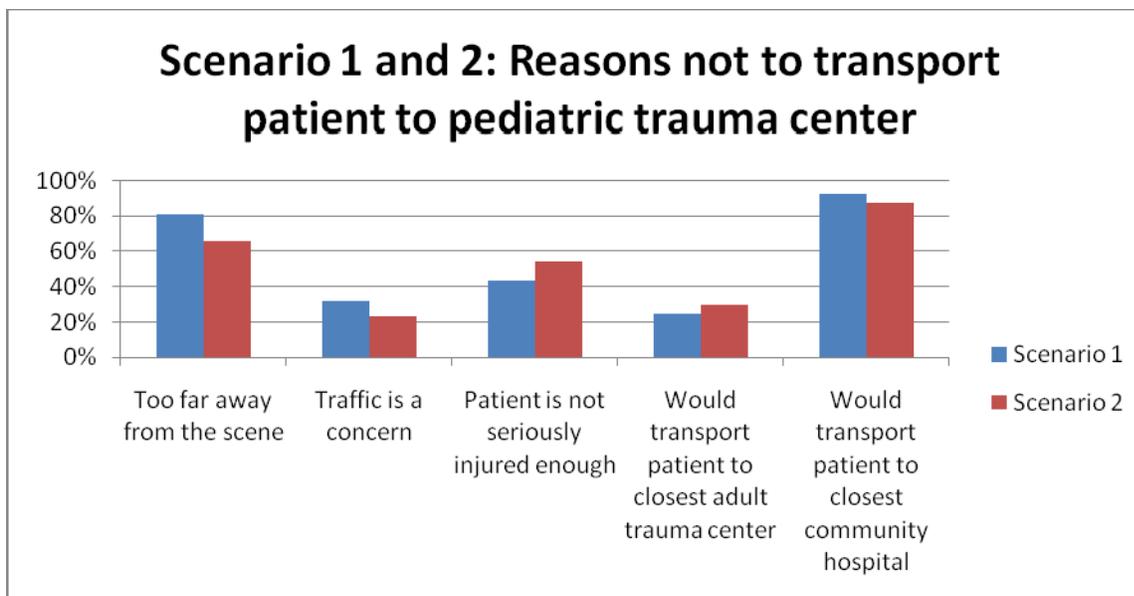


Figure 7.

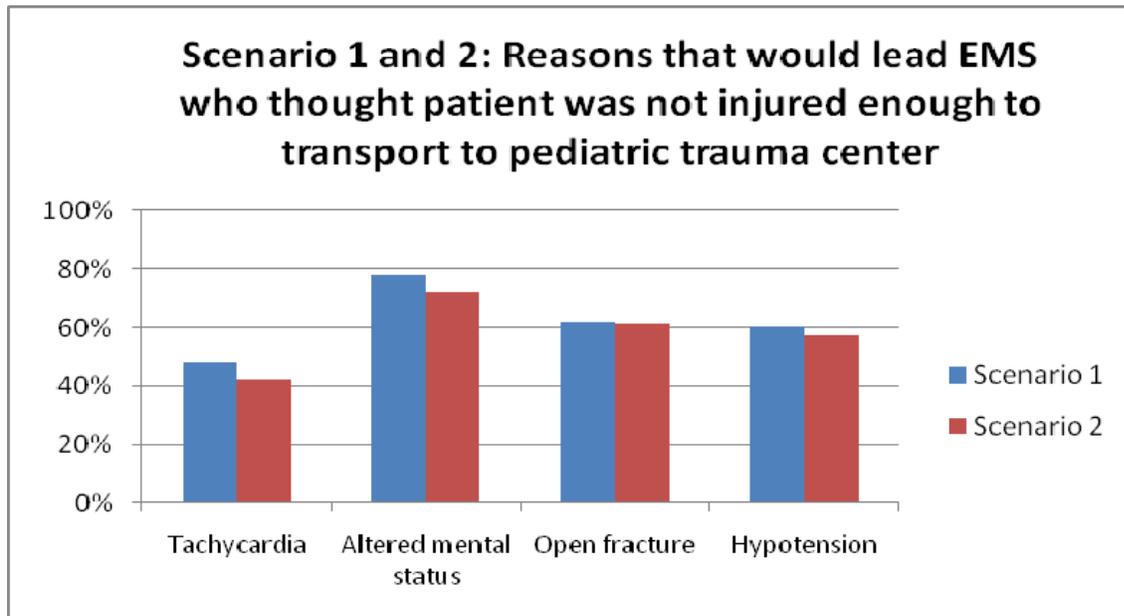


Figure 8.

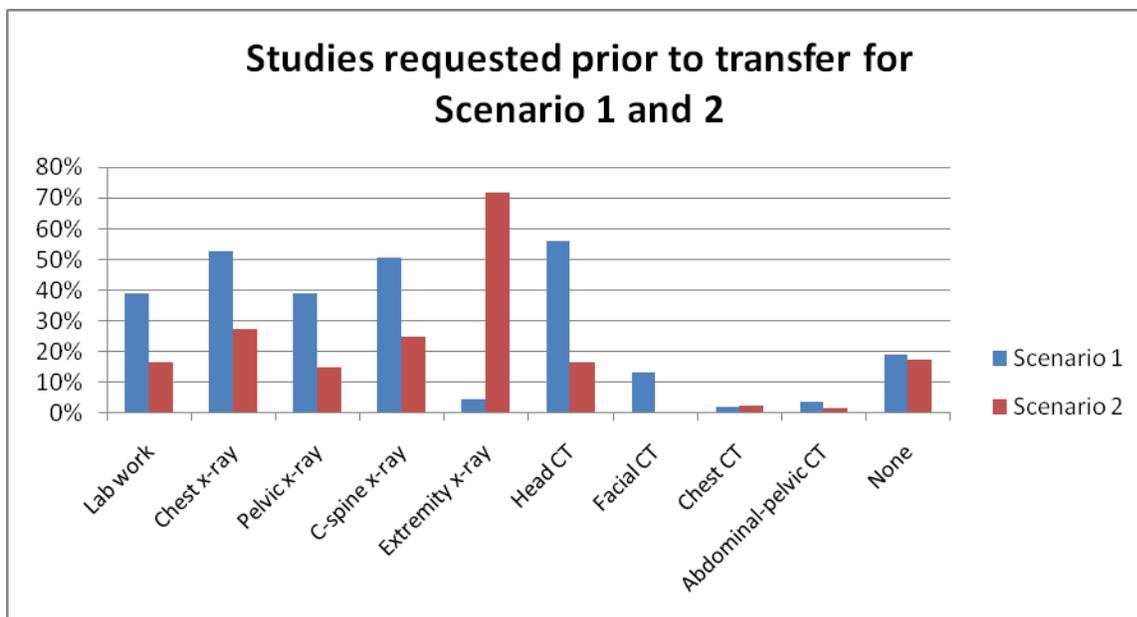


Figure 9.

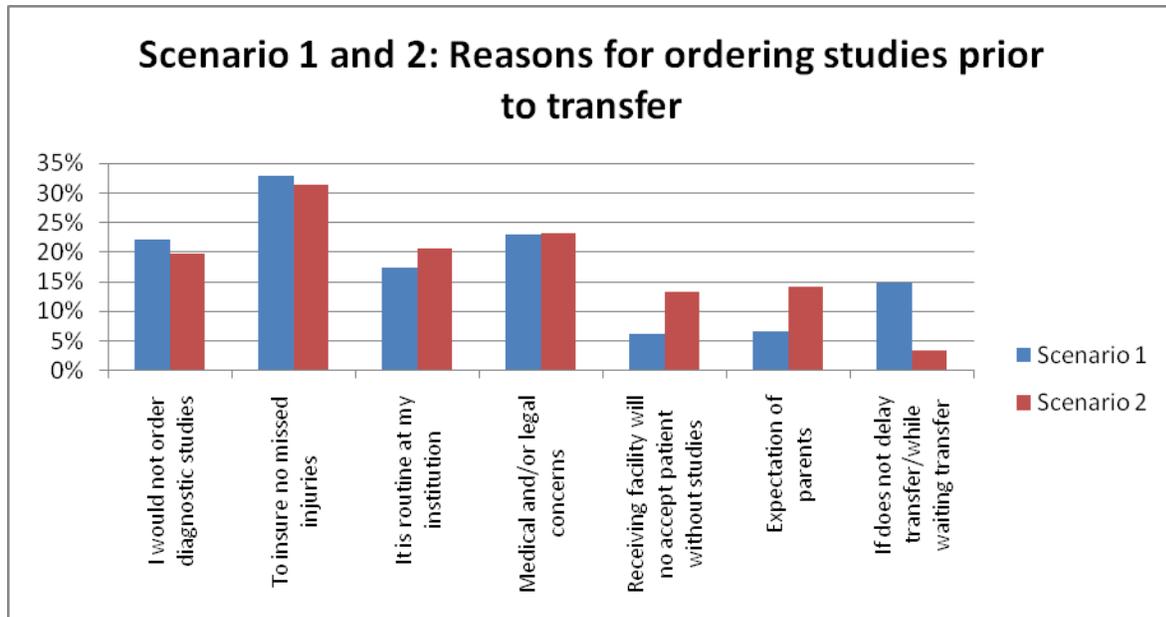


Figure 10.

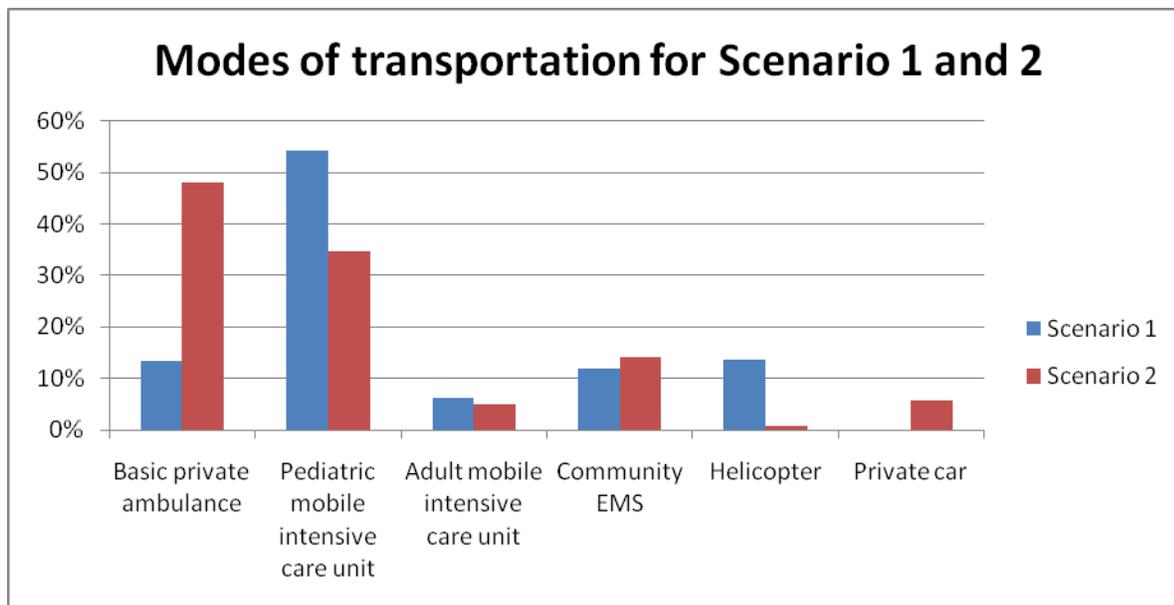


Figure 11.

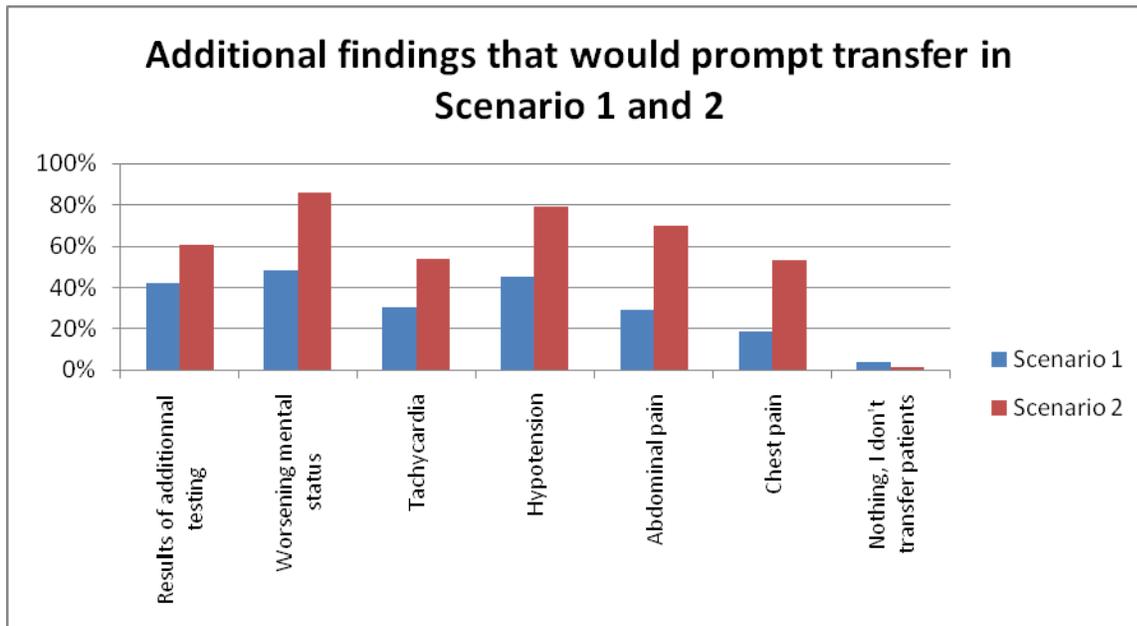
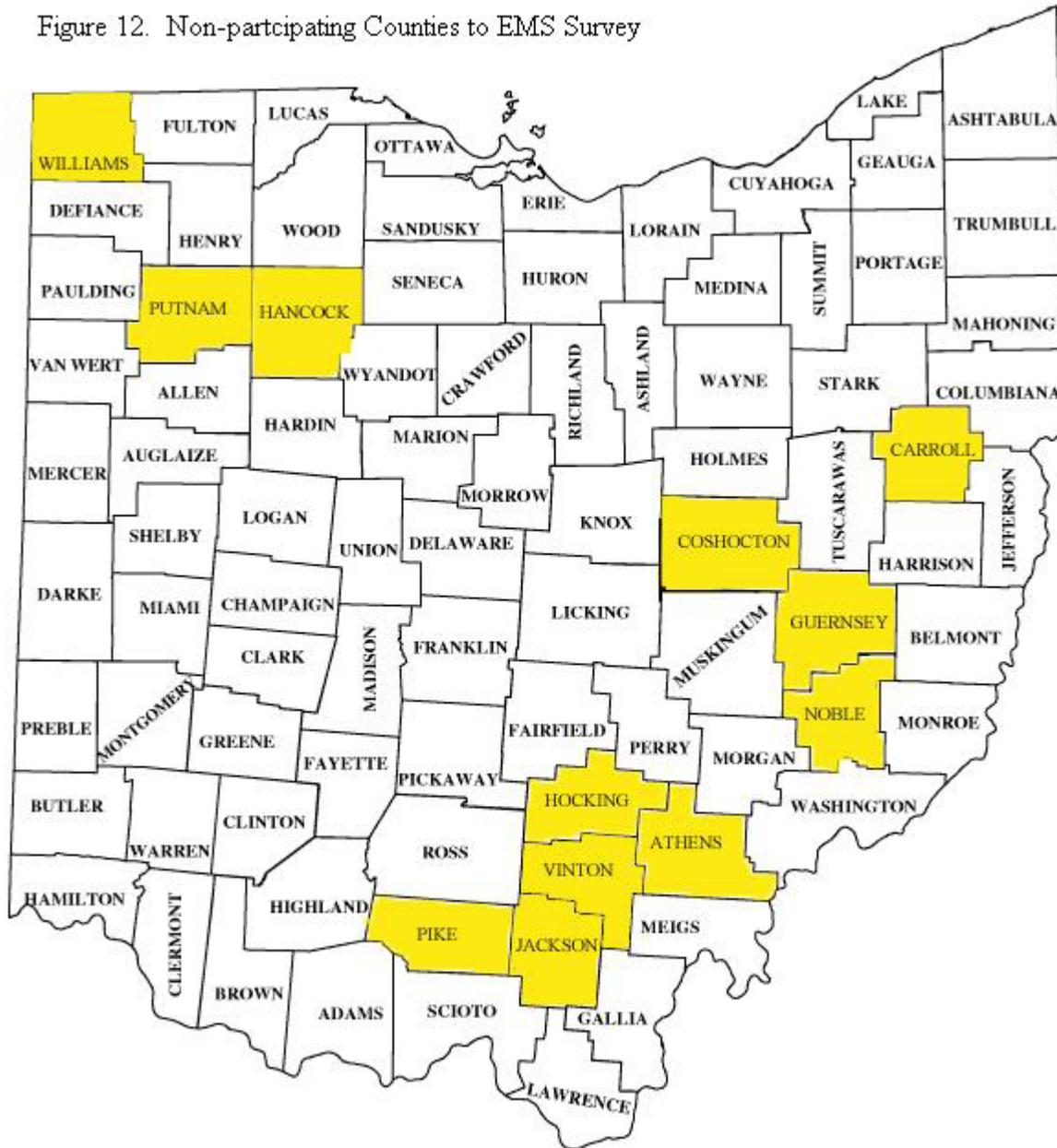


Figure 12. Non-participating Counties to EMS Survey



Total Project Expenditures

Budget Description	Total Project Expenditures
Personnel Costs	
Trauma Staff	\$10,228.49
Materials & Supplies	
Printing expenses, postage, letterhead and mailing list from ACEP (American College of Emergency Physicians)	\$2,160.72
Equipment Purchases	
None	\$0
Contractual Services	
None	\$0
Meetings/Events	
None	\$0
Other	
Incentive gift cards	\$10,030.00
Total Project Expenditures	\$22,419.21

Appendix 1: EMS Survey

Demographic questions:

1) Years certified as an EMT-P _____ EMT-I _____ EMT-B _____

2) Practice status:

Full-time EMS Only _____ Part-time EMS Only _____

Volunteer EMS Only _____

Full-time Firefighter/EMS _____ Part-time Firefighter/EMS _____

Volunteer Firefighter/EMS _____

Full-time EMS Officer/Supervisor _____ Part-time EMS Officer/Supervisor _____

Not practicing in the field at this time _____

If you are not practicing in the field at this time please skip to the end

3) Is your primary employer a 911-responder service? Yes _____ No _____

4) What are the county, state, and zip code where you practice (primary employer)?

County _____ State _____ Zip code _____

5) Is your primary employer service: rural _____ urban _____ suburban _____

6) How many pediatric CEU's do you obtain annually? (Numeric only) _____

7) How many departments do you work for? _____

8) How many pediatric patients would you estimate you treat annually?

_____ None

_____ 1-5

_____ 6-10

_____ 11-25

_____ 26-50

_____ over 50

9) How many pediatric intubations do you perform annually?

_____ 0

_____ 1-5

_____ 6-10

_____ 11-15

_____ over 15

10) Throughout your career, how many intraosseous lines have you placed on children under 10 years old?

- 0
- 1-5
- 6-10
- 11-15
- over 15

11) The closest pediatric trauma center is how many miles from your primary department?

- 1-10 miles
- 11-20 miles
- 21-30 miles
- 31-40 miles
- 41-50 miles
- over 51 miles

12) What is your average transport time to the pediatric trauma center? (In minutes) _____

13) The closest adult trauma center is how miles from your primary department?

- 1-10 miles
- 11-20 miles
- 21-30 miles
- 31-40 miles
- 41-50 miles
- over 51 miles

14) What is your average transport time to the adult trauma center? (In minutes) _____

15) The closest community hospital is how miles from your primary department?

- 1-10 miles
- 11-20 miles
- 21-30 miles
- 31-40 miles
- 41-50 miles
- over 51 miles

16) What is your average transport time to the community hospital? (In minutes) _____

Please respond to the following scenario based questions. If you have more than one EMS employer, base your responses from what you consider your primary place of employment. In addition, please answer these questions based on your current practice, not what you believe the “correct” answer may be.

Scenario 1

You arrive at the scene of an accident of an 8 year-old struck by a car traveling approximately 25 miles per hour. The 8 year old is awake and there was no witnessed loss of consciousness. The child presents with an abrasion to the abdomen and complains of mild pain on palpation. Vital signs: blood pressure 92/60; pulse 110; respirations 20. There are no other obvious injuries and the remainder of your exam is normal. The time is 1630.

17) In your practice, and under ideal circumstances, would you transport this child to a trauma center?

- Yes
 No
 Not sure

If you answered yes to question #17 proceed with question #18

If you answered no to question #17 skip to question #22

If you answered not sure to question #17 skip to question #22

18) If your answer to question 17 is **yes**:

Why would you transfer this patient to a pediatric trauma center? (Select all that apply)

- Patient age
 Mechanism of injury
 Patients vital signs
 Patients clinical exam
 Speed of collision
 Meets the State of Ohio definition of trauma

19) If your answer to question 17 is **yes**:

Would you call for air transport for this child?

- Yes
 No
 Not sure

20) If your answer to question 17 is **yes**:

Would you bypass any adult trauma centers to get to the pediatric trauma center?

- Yes
 No
 Not sure

21) If your answer to question 17 is **yes**:

How many children a year do you bring to a pediatric trauma center?

- Less than 5
 5-15
 15-30
 Over 30

Skip to Scenario 2

22) If your answer to question 17 is **no** or **not sure**

Why would you **not** transfer to a pediatric trauma center?

Pediatric trauma center is too far away from the scene of the accident.

- True
 False

23) If your answer to question 17 is **no** or **not sure**

Why would you **not** transfer to a pediatric trauma center?

It is rush hour, traffic might be a concern.

- True
 False

If you answered true to question #23 proceed to question #24

If you answered false to question #23 skip to question #25

24) If your answer to question 23 is **true**

How much longer would you estimate the rush hour traffic will add to your commute to a pediatric trauma center (in minutes)?

_____minutes

25) If your answer to question 17 is **no** or **not sure**
Why would you **not** transfer to a pediatric trauma center?

This child is not seriously injured enough to require transfer to a pediatric trauma center.

True

False

If you answered true to question #25 proceed to question #26

If you answered false to question #25 skip to question #27

26) If your answer to question #25 is **true**
Which of the following findings would make you believe this child should be transported to a pediatric trauma center? (Select all that apply)

Tachycardia

Altered mental status

Open fracture

Hypotension

Other _____

27) If your answer to question 17 is **no** or **not sure**
Why would you **not** transfer to a pediatric trauma center?

I would take the child to the nearest adult trauma center

True

False

If you answered true to question #27 proceed to question #28

If you answered false to question #27 skip to question #30

28) If your answer to question 27 is **true**
Does this hospital have pediatric expertise (i.e. Pediatric trained physicians, additional training in pediatric trauma care, and have a dedicated pediatric area in the emergency department)?

Yes

No

Not sure

29) Do you believe an adult trauma center would provide better care than your closest hospital for this child?

- Yes
 No
 Not Sure

30) In this case, I would transport this child to the nearest facility

- True
 False

If you answered true to question #30 proceed to question #31

If you answered false to question #30 skip to question #32

31) If your answer to question 30 is **true**

Does this hospital have pediatric expertise (i.e. Pediatric trained physicians, additional training in pediatric trauma care, and have a dedicated pediatric area in the emergency department)?

- Yes
 No
 Not sure

32) Do you believe there is ever a reason to bypass the closest hospital to bring a child to a pediatric trauma center?

- Yes
 No
 Not sure

33) Do you believe there is ever a reason to bypass the closest hospital to bring an adult to an adult trauma center?

- Yes
 No
 Not sure

34) Would you ever bypass the closest hospital to bring an adult patient to an adult trauma center?

- Yes
 No
 Not sure

35) I do not consider this a trauma as defined by the State of Ohio definition of trauma

True

False

Scenario 2

You are responding to a multi-car crash on a busy rural road. Upon arrival you find three cars; two with heavy front-end damage and one car with heavy damage to the front-end and rear quarter panel on the driver's side. Police direct you to the vehicle with front and rear damage. The vehicles driver is dead. In the back seat is a three-year-old boy restrained in a 5 point convertible car seat. He is awake and crying, with no increased work of breathing and has strong peripheral and central pulses. Vital signs are: blood pressure 96/60; pulse 116; respirations 24. You note a 2 cm laceration above his left eye and the rest of your exam is normal.

36) In your practice, and under ideal circumstances, would you transport this child to a trauma center?

Yes

No

Not sure

If you answered yes to question #36 proceed with question #37

If you answered no to question #36 skip to question #41

If you answered not sure to question #36 skip to question #41

37) If your answer to question 36 is **yes**:

Why would you transfer this patient to a pediatric trauma center? (Select all that apply)

Patient age

Mechanism of injury

Patients vital signs

Patients clinical exam

Death of another passenger

Amount of damage to the vehicles

Meets the State of Ohio definition of trauma

38) If your answer to question 36 is **yes**:
Would you call for air transport for this child?

- Yes
 No
 Not sure

39) If your answer to question 36 is **yes**:
Would you bypass any adult trauma centers to get to the pediatric trauma center?

- Yes
 No
 Not sure

40) If your answer to question 36 is **yes**:
How many children a year do you bring to a pediatric trauma center?

- Less than 5
 5-15
 15-30
 over 30

Skip to end

41) If your answer to question 36 is **no** or **not sure**
Why would you **not** transfer to a pediatric trauma center?

Pediatric trauma center is too far away from the scene of the accident.

- True
 False

42) If your answer to question 36 is **no** or **not sure**
Why would you **not** transfer to a pediatric trauma center?

It is rush hour, traffic might be a concern.

- True
 False

If you answered true to question #42 proceed to question #43
If you answered false to question #42 skip to question #44

43) If your answer to question 42 is **true**

How much longer would you estimate the rush hour traffic will add to your commute to a pediatric trauma center (in minutes)?

____ minutes

44) If your answer to question 36 is **no** or **not sure**

Why would you **not** transfer to a pediatric trauma center?

This child is not seriously injured enough to require transfer to a pediatric trauma center.

____ True

____ False

If you answered true to question #44 proceed to question #45

If you answered false to question #44 skip to question #46

45) If your answer to question #44 is **true**

Which of the following findings would make you believe this child should be transported to a pediatric trauma center? (Select all that apply)

____ Tachycardia

____ Altered mental status

____ Open fracture

____ Hypotension

____ Other _____

46) If your answer to question 36 is **no** or **not sure**

Why would you **not** transfer to a pediatric trauma center?

I would take the child to the nearest adult trauma center

____ True

____ False

If you answered true to question #46 proceed to question #47

If you answered false to question #46 skip to question #49

47) If your answer to question 46 is **true**

Does this hospital have pediatric expertise (i.e. Pediatric trained physicians, additional training in pediatric trauma care, and have a dedicated pediatric area in the emergency department)?

- Yes
 No
 Not sure

48) If your answer to question 36 is **no** or **not sure**

Do you believe an adult trauma center would provide better care than your closest hospital for this child?

- Yes
 No
 Not Sure

49) If your answer to question 36 is **no** or **not sure**

In this case, I would transport this child to the nearest facility

- True
 False

If you answered true to question #49 proceed to question #50

If you answered false to question #49 skip to question #51

50) If your answer to question 49 is **true**

Does this hospital have pediatric expertise (i.e. Pediatric trained physicians, additional training in pediatric trauma care, and have a dedicated pediatric area in the emergency department)?

- Yes
 No
 Not sure

51) Do you believe there is ever a reason to bypass the closest hospital to bring a child to a pediatric trauma center?

- Yes
 No
 Not sure

52) Do you believe there is ever a reason to bypass the closest hospital to bring an adult to an adult trauma center?

- Yes
 No
 Not sure

53) Would you ever bypass the closest hospital to bring an adult patient to an adult trauma center?

- Yes
 No
 Not sure

54) I do not consider this a trauma as defined by the State of Ohio definition of trauma

- True
 False

Thank you for completing the survey. Please return in the enclosed self-addressed stamped envelope.

*****Please encourage the EMS providers in your department to complete the survey at the following link:**

<http://www.surveymonkey.com/s/MSTW73W>

Appendix 1 (Continued)
Physician Survey
Demographic questions

1. Are you still in training?

Yes
 No

2. Are you residency trained in Emergency Medicine?

Yes
 No

3. Are you fellowship trained in Pediatric Emergency Medicine?

Yes
 No

4. Do you have any area of particular interest or specialization?

Yes (please specify) _____
 No

5. How many years have you been in practice?

_____ years

6. How many years of practice do you have in an Emergency Department?

_____ years

7. Do you work full-time in an Emergency Department?

Yes
 No

8. Do you work in a verified adult trauma center?

Yes
 No
 Don't know

9. Do you work in a verified pediatric trauma center?

- Yes
 No
 Don't know

If you answered yes to question #9 please skip to the end

10. How many pediatric CME's do you obtain on an average annually?

11. Approximately how many pediatric patients would you estimate you treat annually?

- None
 1 – 25
 26 – 50
 51 – 100
 101 – 200
 over 201

12. Approximately how many pediatric intubations did you perform during the last 12 months?

- None
 1 – 5
 6 – 10
 11 – 15
 over 15

13. Approximately how many intraosseous lines have you placed on children under 10 years of age in the last 12 months?

- None
 1 – 5
 6 – 10
 11 – 15
 over 15

14. Approximately how many central lines have you placed in children less than 17 years of age in the last 12 months?

- None
- 1 – 5
- 6 – 10
- 11 – 15
- over 15

15. Approximately how many chest tubes have you placed in children less than 17 years of age in the last 12 months?

- None
- 1 – 5
- 6 – 10
- 11 – 15
- over 15

16. The closest pediatric trauma center from your primary work place is how many miles away?

- I work at a pediatric trauma center
- 1 – 10 miles
- 11 – 20 miles
- 21 – 30 miles
- 31 – 40 miles
- 41 – 50 miles
- over 51 miles

Please answer the questions related to the following scenarios as if you were working at your primary place of service. For example: if you work in more than one emergency department, please answer scenario questions based on your practice at the location you most frequently work. In addition, please answer these questions based on what you would actually do, not what you believe the “correct” answer may be.

Scenario 1

A 12 year-old presents to your emergency department with facial pain 30 minutes after crashing a dirt bike. The patient states that the “rear of the bike slid out” from under her causing her to be thrown from the bike; her brother reports that she had a “brief” loss of consciousness. She is complaining of facial, right arm, and right leg pain. She is also holding a retainer in her hand. You note her to be awake and alert with a GCS of 15. Vital signs: blood pressure 108/72; pulse 96; respiratory rate 24; temperature 36.4 (97.6) axillary; oxygen saturation on room air 98%. Your physical exam finds abrasions to her forehead, nose, right arm, and right lower leg. She is also complaining of facial pain on palpation and has bilateral periorbital contusions as well as a dental mal-occlusion. Remainder of the scalp and neck exam is normal to inspection and palpation. Thorax, abdominal and pelvic exam is unremarkable.

17. In your practice, according to the State of Ohio definition of trauma, would you consider and treat this patient as a trauma patient?

- Yes
- No
- Not sure

18. Is there an on-call surgeon available 24/7 at your facility to help manage this patient?

- Yes, a pediatric general surgeon
- Yes, an adult general or trauma surgeon
- Yes, both a pediatric general surgeon and an adult general or trauma surgeon
- No
- Not sure

19. Would you transfer this patient to a pediatric trauma center?

- Yes
- No
- Not sure

If you answered yes to question #19 proceed to question #20

If you answered no to question #19 skip to question #23

If you answered not sure or other to question #19 skip question #23

20. If you answered **yes** to question #19

Prior to transfer would you perform the following: (select all that apply)

- Lab work
- Chest x-ray
- Pelvic x-ray
- C-spine x-ray
- Head CT
- Chest CT
- Abdominal/pelvic CT
- None
- Other (please specify) _____

21. If you answered **yes** to question #19

If you ordered diagnostics prior to transfer please select all that apply.

- I would not order diagnostics
- To assure no missed injuries
- Routine at my institution
- Medical and/or legal concern
- Receiving facility will not accept patient without studies
- Expectation of parents
- Other (please specify) _____

22. If you answered **yes** to question #19

Which mode of transportation would you use to transport this patient to a pediatric trauma center?

- Basic private ambulance service
- Pediatric mobile intensive care unit (including transport teams from a pediatric trauma center)
- Adult mobile intensive care unit
- Community EMS
- Helicopter
- Private car

Skip to Scenario 2

23. If you answered **no** to question #19

Would you transfer the patient to an adult trauma center?

Yes

No

No, I currently work in an adult trauma center

Not sure

24. If you answered **no** to question #19

What additional findings might prompt you to transfer to a pediatric trauma center? (select all that apply)

Results of additional testing

Worsening mental status

Tachycardia

Hypotension

Abdominal pain

Chest pain

Nothing. I don't transfer patients

Scenario 2

You are asked by the nurse to examine a 4 year-old patient who has fallen approximately 5 feet from a tree. He was brought in by the parents by private vehicle. The patient is crying, being held in mom's arms with an obvious deformity of the right forearm. Your exam finds the patient to be awake and alert, consoled somewhat by the mother. Vitals show blood pressure: 98/68; pulse 125; respirations 26; temperature 37.2 (99) orally, oxygen saturation on room air 99%. You note an obvious deformity of the right forearm moderate edema and obvious tenderness. Distal exam of that arm shows intact finger movements with a strong radial pulse present. Sensory exam is limited by patient age and anxiety but seems intact. There are also abrasions noted on the patient's right cheek and hand. You do not palpate tenderness or instability to the face. Remainder of the scalp and neck exam is normal to inspection and palpation. Thorax, abdominal and pelvic exam is unremarkable.

25. In your practice, according to the State of Ohio definition of trauma, would you consider and treat this patient as a trauma patient?

Yes

No

Not sure

26. Is there an on-call surgeon available 24/7 at your facility to help manage this patient?

- Yes, a pediatric general surgeon
- Yes, an adult general or trauma surgeon
- Yes, both a pediatric general surgeon and an adult general or trauma surgeon
- No
- Not sure

27. Would you transfer this patient to a pediatric trauma center?

- Yes
- No
- Not sure

If you answered yes to question #27 proceed to question #28

If you answered no to question #27 skip to question #31

If you answered not sure or other to question #27 skip to question #31

28. If you answered **yes** to question #27

Prior to transfer would you perform the following (select all that apply)

- Lab work
- Chest x-ray
- Pelvic x-ray
- C-spine x-ray
- Head CT
- Chest CT
- Abdominal/pelvic CT
- None
- Other (please specify) _____

29. If you answered **yes** to question #27

If you ordered diagnostics prior to transfer please select all that apply.

- I would not order diagnostics
- To assure no missed injuries
- Routine at my institution
- Medical and/or legal concern
- Receiving facility will not accept patient without studies
- Expectation of parents
- Other (please specify) _____

30. If you answered **yes** to question #27

Which mode of transportation would you use to transport this patient to a pediatric trauma center?

Basic private ambulance service

Pediatric mobile intensive care unit (including transport teams from a pediatric trauma center)

Adult mobile intensive care unit

Community EMS

Helicopter

Private car

Skip to the end

31. If you answered **no** to question #27

Would you transfer the patient to an adult trauma center?

Yes

No

No, I currently work in an adult trauma center

Not sure

32. If you answered **no** to question #27

What additional findings might prompt you to transfer to a pediatric trauma center? (select all that apply)

Results of additional testing

Worsening mental status

Tachycardia

Hypotension

Abdominal pain

Chest pain

Nothing. I don't transfer patients

Thank you for completing the survey. Please return in the enclosed self-addressed stamped envelope.

****Please encourage the Emergency Physician's in your department to complete the survey at the following link:**

<http://www.surveymonkey.com/s/KHTRFHC>