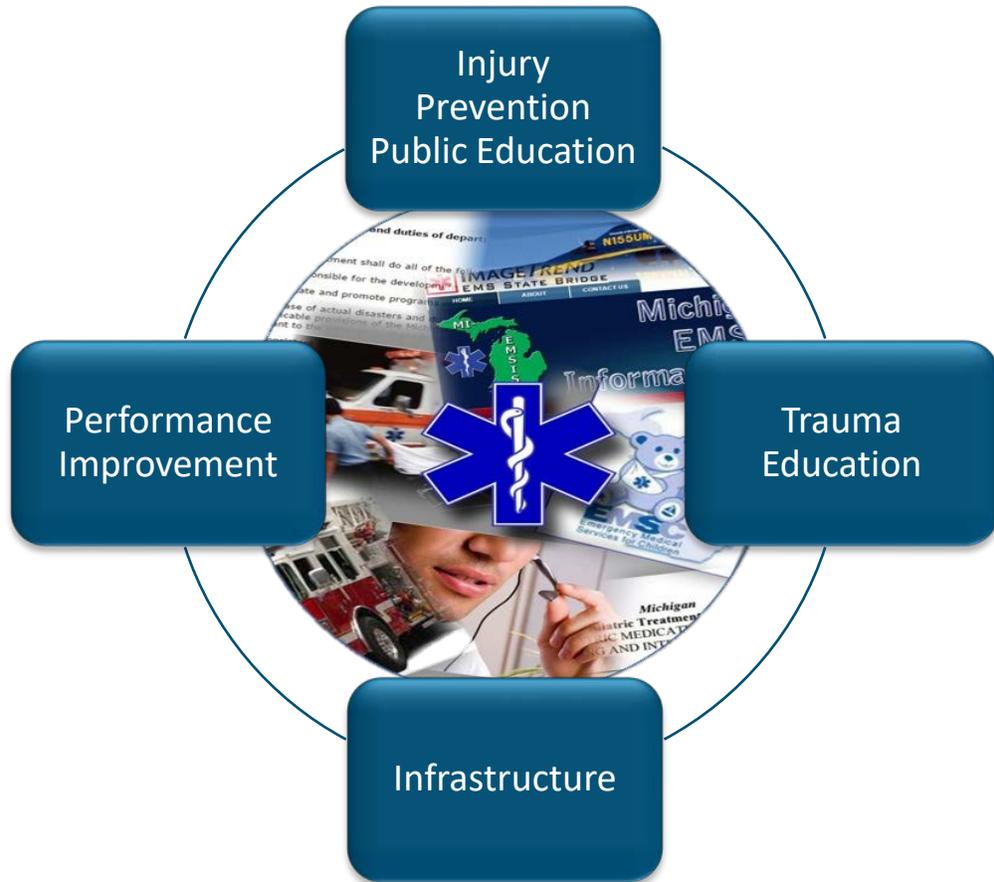


Michigan Trauma System Development Projects 2017



OCTOBER 15, 2018

Division of EMS, Trauma and Preparedness

Authored by: Trauma Section

Eileen Worden

State Trauma Manager

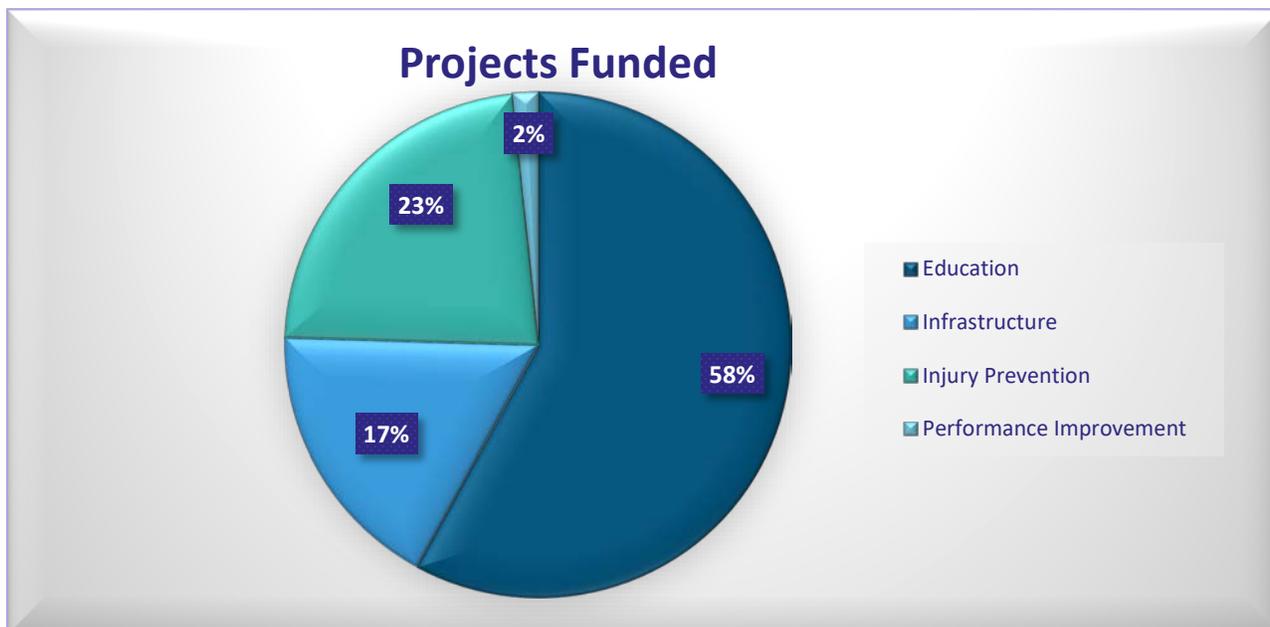
Background

Michigan has been engaged in trauma system development since the creation of the Trauma Commission by Public Act 440 of 2000. Michigan's Trauma System was formalized by legislation in 2004. The system was funded in 2012.

Ongoing commitment of resources is integral to ensuring a strong system is in place to meet the needs of the injured or potentially injured. Frontline partners and stakeholders involved in the trauma system understand the gaps and challenges in program development and community needs and are positioned to address those needs. In 2017, the Bureau of EMS, Trauma and Preparedness (BETP) allocated 1.3 million dollars in the form of grants to support system building at the regional, community, EMS agency or individual trauma facility level. This funding provided an opportunity to identify gaps and implement mitigation strategies in their programs based on national standards.

The Michigan Trauma System Development Project was designed to address four broad categories of system building: Injury Prevention, Trauma Education, Performance Improvement and Trauma Infrastructure. Partners submitted a total of 160 applications; and of those, 76 projects were funded. The breakdown of funding categories is depicted in figure 1.

Figure 1 Breakdown of Trauma System Development Project Categories Funded



Priority consideration was given to projects that were: evidence based, could be replicated, satisfied an unmet need, measurably reinforced and supported the trauma system, expanded on existing partnerships. The projects started in September of 2016 and were completed in September 2017. This report describes some of the projects that represent each of the categories.



|| TRAUMA EDUCATION

Foundational to maintaining a competent workforce is education. “Maintenance of competence should be ensured by requiring standards for credentialing and certification and specifying continuing educational requirements for physicians and nurses providing care to trauma patients...In cooperation with the prehospital certification and licensure authority, ensure that prehospital personnel who routinely provide care to trauma patients have a current trauma training certificate, for example, Prehospital Trauma Life Support (PHTLS) or Basic Trauma Life Support (BTLS) and others or that trauma training needs are driven by the performance improvement process.”¹ A total of 43 trauma education projects were funded, resulting 61 trauma courses being held. Courses were held in all eight trauma regions of the state. Courses offered include:

-  Trauma Care After Resuscitation (TCAR) 11 courses
-  International Trauma Life Support (ITLS) 3 courses
-  Pediatric Care After Resuscitation (PCAR) 2 courses
-  Trauma Nursing Core Course (TNCC) 14 courses
-  Advanced Trauma Care for Nurses (ATCN) 5 courses
-  Rural Trauma Team Development Course (RTTDC) 1 course
-  Trauma Certified Registered Nurse (TCRN) 1 course
-  Advanced Trauma Life Support (ATLS) 9 courses
-  General Trauma Education 10 courses
-  Prehospital Trauma Life Support (PHTLS) 5 courses

We recently had a pediatric trauma patient that fell from a tree more than two times their height. Because the nurse that was caring for this patient, had the TNCC training, they recognized the potential injuries and activated the trauma team to quickly care for and transfer this patient to the most appropriate pediatric trauma center.

*Spectrum Health Gerber Memorial
Funded to support TNCC, trained 13 nurses*

¹ *The American College of Surgeons Committee on Trauma, Regional Trauma Systems: Optimal Elements, Integration and Assessment System Consultation Guide*

Oakland County Medical Control Authority (Online Education)

The Oakland County Medical Control Authority (OCMCA) and American CME developed a web-based video titled *ACS Guidelines for Field Triage of Injured Patients*. This online course is free to all EMS providers throughout the state and covers the Centers for Disease Control and Prevention (CDC), *Guidelines for Field Triage of Injured Patients*.

-  The course is consistent with State EMS Protocols for trauma triage. The course content covers the importance of the Field Triage Decision Scheme (FTDS), how to identify patients needing care using the criteria outlined in the FTDS and understanding the value of using FTDS.
-  At the time of reporting a total of 1,944 prehospital providers had taken the course.

Spectrum Health (Trauma Time Out)

Patient hand-offs have been recognized as times that are at high risk for errors to occur. This can be especially true in environments that are chaotic with many things happening at one time, such as during a trauma resuscitation. Short time outs prior to procedures has been proven to decrease errors. The time out process has been utilized successfully in trauma hand off scenarios.² Spectrum Health developed two videos on the benefits of the time out process for trauma hand offs.

-  The videos, “Trauma Team Time Out” and “60 Seconds of Silence” were filmed in two different settings, a Level I and a Level IV trauma center.
-  The videos demonstrate how these safety initiatives can be implemented in different settings with variable resources and reinforce safety initiatives with hospital and EMS team members.

Kalkaska, Mancelona & Forest School Districts (Concussion Program)

Concussion Recognition and Neurological Intervention, United Management (CRANIUM) is a concussion management program that utilizes three standardized and evidenced based tools for the recognition of sports related concussions and clearance tools to utilize prior to returning athletes to play.

² Nolan, H.R., Fitzgerald, M., Howard, B., Jarrad, J., Vaughn, D. (2017). The trauma time-out: Evaluating the effectiveness of protocol-based information dissemination in the traumatically injured patient. *Journal of Trauma Nursing*. May/Jun;24(3):170-173.

-
-  CRANIUM training was provided to health care providers interacting with student athletes in the Kalkaska, Mancelona and Forest school districts.
 -  There were also six educational seminars provided for student athletes, parents, coaches and teachers in these school districts.
 -  As a result of the trainings, nearly 30 student athletes were referred to Kalkaska Memorial Health Center for a suspected concussion.



|| INJURY PREVENTION

According to the CDC (2009),³ “Injury is the leading cause of death for persons aged 1-44 years” In addition to deaths, disabilities and ongoing health issues related to trauma impose a major economic burden on communities and individuals. In Michigan, the costs associated with crash related deaths alone top one billion dollars.⁴ Total lifetime costs from injuries and violence in the U.S. in 2013 were 671 billion dollars.⁵ Injury prevention is the best way to decrease the morbidity and mortality associated with trauma. (CDC, 2009). Trauma center staff have a responsibility to develop partnerships and work collaboratively with their communities to identify and prioritize relevant injury prevention programs.⁶ The top two causes of injuries for patients admitted to the hospital in Michigan are: slipping, tripping, and falls representing 57% of all injury cases reported in the state trauma registry; followed by land transportation accidents at 23%.

In order to support this critical component of a well-functioning trauma system, 17 injury prevention initiatives were funded by the Trauma System Development grants. The programs described demonstrate the injury prevention initiatives that reflect specific community needs addressed in unique ways. Several of the initiatives are highlighted in this report.

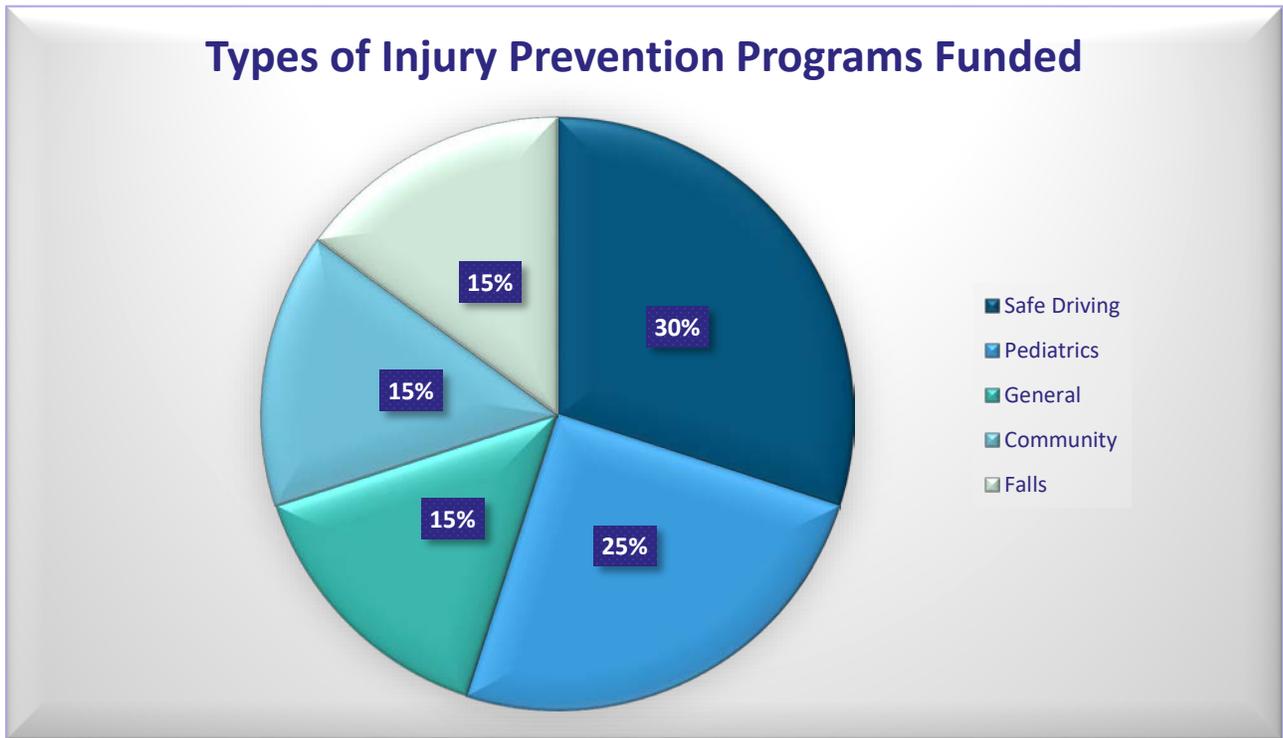
³ Centers for Disease Control and Prevention. (2009). Guidelines for field triage of injured patients: Recommendations of the national expert panel on field triage. *Morbidity and Mortality Weekly Report*. January 23, 2009. 58(RR01);1-35. Retrieved September 20, 2018, from <https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5801a1.htm>.

⁴ Michigan Department of Health and Human Services. (2018). *Michigan Statewide Trauma System*. https://www.michigan.gov/mdhhs/0,5885,7-339-71551_69345---,00.html.

⁵ Centers for Disease Control and Prevention. (2016). Cost of injuries and violence in the United States. Retrieved September 20, 2018, from https://www.cdc.gov/injury/wisqars/overview/cost_of_injury.html.

⁶ American College of Surgeons. (2014). *Resources for Optimal Care of the Injured Patient*. p. 139.

Figure 2 Categories of Injury Prevention Programs Funded



McLaren Northern Michigan

Trauma Registry Data was reviewed to identify areas of focus. The analysis indicated: indicated that the top three most common traumas treated were: falls (52%), motor vehicle accidents (19%), and bicycle related injuries (3%). Based on that assessment, several initiatives were conducted:

- ⚠️ Brochures, banners and ads specific to injury prevention, distracted driving, and fall prevention were developed and used at health fairs, community meetings, and presentations at other public forums.
- ⚠️ An injury prevention television spot was produced and aired 50 times on Channels 7&4, 9&10 and cable networks <https://youtu.be/JVzwdN2LQKE> . The spot has also been posted on the Hospital website, YouTube channel and social media.
- ⚠️ Child Passenger Safety Training was completed by three staff members and 96 car seat inspections were conducted.
- ⚠️ A Matter of Balance fall prevention course was taught to 32 community members to address trauma related to falls.
- ⚠️ In total, there were 1,117 residents in northern Michigan who participated in these outreach events.

Wayne County (Downriver-Distracted Driving Awareness Program)

The number of teens driving is greatly disproportional to the number of crashes in which they are involved. In 2013, while youth ages 16-20 represented only 6.9% of drivers on the road, that age group represented 11.6% of all crashes in Wayne County. The Downriver-Distracted driving program (D-DAP) is a partnership that was developed with the 33rd District Court, Oakwood Foundation for Beaumont Hospital and Beaumont Hospital Trenton Trauma Department. The goal of the program is to reduce injuries caused by teen distracted driving.

- ⚠️ Targets young drivers between the ages of 16-20 that have been cited because of their involvement in a traffic accident or ticketed for distracted driving.
- ⚠️ A two- hour class that includes a tour of the trauma room, use of a distraction simulator, an educational presentation and videos as well as attendance documentation for court use and evaluation.
- ⚠️ At the conclusion of the course, participants commit to taking specific steps to drive safe including: formulate a plan for distraction free driving, signing a safe driving pledge, and returning to court with documentation they completed the class.
- ⚠️ Initially 19 traffic offenders were referred to the program. Once underway, two other members of the judiciary began to refer to the program bringing the total to 36.
- ⚠️ Out of the initial 19 referred to the program there was only one reported re-offender.
- ⚠️ In the post course survey, 77 % indicated that they were “very likely” to change their behavior related to updating social media, drunk driving, running red lights and 74% reported “very likely” they would change behavior regarding texting/emailing.
- ⚠️ The City of Taylor is considering bringing the program to their District Court.

Today I learned that serious damage can be done by distracted driving. Distracted driving does not only include using cell phones, but also eating, changing music, fighting with siblings etc. A few seconds of pulling over your car and finishing your task can save regret for the rest of your life (like killing someone).

Participant in the Downriver Distracted Driving Awareness Program

McLaren Oakland Foundation and Partners (Safe Wheels and Heels)

In the United States, bicycling is the second most frequent sport and recreation activity, after football, leading to emergency department visits for children. Support for the Safe Wheels and Heels program allowed the McLaren Oakland Foundation and partners to expand the existing program to cover the Pontiac, Clarkston, Waterford and Oxford School districts.

- ⚠️ A driving simulator was purchased for community events to promote distraction free and substance free driving.
- ⚠️ Bike helmets and education was provided to 1,701 second graders and an additional 300 other children at other community events.
- ⚠️ 97% of parents reported that they believed the program increased the safety awareness of their child and/or family, and 95% of parents reported their children verbalized the importance of wearing their bicycle helmet.
- ⚠️ More than 600 volunteer hours were committed to 25 school assemblies that ensured every child left with a helmet that fit properly.
- ⚠️ Community fire departments agreed to hand out coupons for ice cream if they saw children wearing their helmets.

Helen DeVos Children's Hospital (Special Needs Car Seats)

Car seats can be an expensive, yet necessary purchase. Children with special needs such as cerebral palsy or spinal cord problems may require adaptive car seats for safety. Often parents do not realize that car seats designed specifically for children with special healthcare needs are available, and they end up using conventional seats that are not safe. Helen DeVos Children's Hospital purchased 30 different special needs seating options (three seats were donated by the company after hearing about the program) to help families choose the safest, most appropriate car restraint systems for the 50 special needs children the program annually serves.

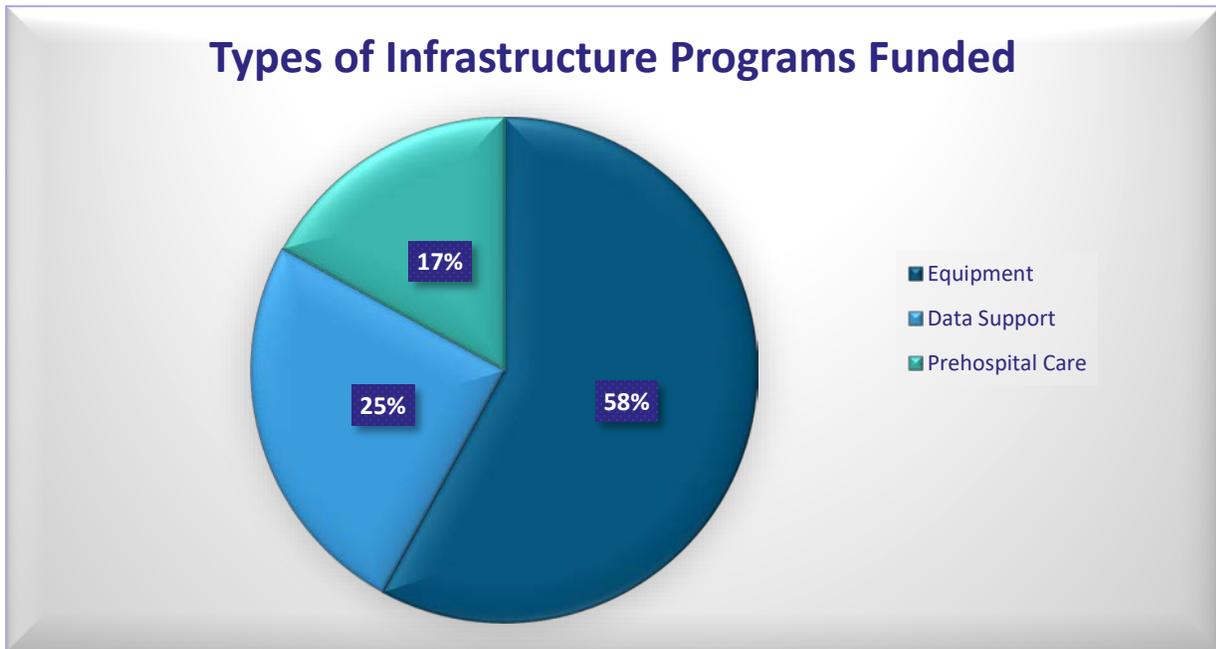
- ⚠️ The parents were able to work with staff to evaluate a variety of options for the best fit for their children.
- ⚠️ The car seats also demonstrated to parents the options available for older, larger, children to ride safely.
- ⚠️ Car seats are frequently being updated and having the ability to test and evaluate the available options in person with trained staff helped parents make appropriate and economically feasible decisions regarding purchases.



Literature suggests that the average annual cost for trauma centers to maintain essential infrastructure and capacity to provide 24/7 emergent services is 6.8 million dollars for a Level I trauma facility, and 2.3 million dollars for a Level II trauma facility. These costs are based on four categories: administrative, clinical medical staff, operating room and education/outreach.⁷

Michigan has 37 Level I and Level II facilities verified and designated. There are 39 facilities currently designated as level III or IV. All eligible facilities in MI have provided their intent to be verified or designated as trauma centers. A significant number of these are smaller facilities serving rural communities with fewer resources than the Level I and Level II trauma facilities that are located in more urban areas of the State. Of the thirteen infrastructure applications received, three were related to data collection and seven were for equipment. Grants in this category provided an opportunity for facilities to manage some of the identified gaps in their program infrastructure.

Figure 3 Categories of Infrastructure Programs Funded



⁷ Ashley, D.W., Mullins, R.F., Dente, C.J., Garlow, L., Medeiros, R.S., Atkins, E.V., Solomon, G., Abston, D., Ferdinand, C.H. (2017). What are the costs of trauma center readiness? Defining and standardizing readiness costs for trauma centers statewide. (Abstract) *Am. Surg.* 83(9): 979-990. Retrieved September 20, 2018, from <https://www.ncbi.nlm.nih.gov/pubmed/28958278>.

Upper Peninsula Health System Bell (Rapid Infusion Pump)

UPHS Bell is a 25 bed critical access hospital located in Michigan's Upper Peninsula. In this area of the State that receives 250 inches of snow annually, there is a need to be able to rapidly infuse warmed fluids for trauma patients. Their rapid infusion fluid warmer was 14 years old. Funds were used to replace the rapid infusion fluid warmer.

OSF St. Francis Hospital (Airway Management)

Maintaining a stable airway is critical to successful trauma resuscitation. Trauma patients may have injuries that impact the ease with which an airway can be established. Specialized equipment can improve the efficiency and effectiveness of airway management in difficult airway situations.

- OSF St. Francis Hospital purchased a Glidescope® to facilitate rapid and safe intubation of patients with a compromised airway.
- A *Difficult Airway* course was offered for the entire region with 37 attendees including: EMS providers, RNs, Trauma Program Managers, Trauma Medical Directors, physicians and advanced practitioners.
- Subsequently the Glidescope® was successfully used on a severely injured patient who was then transferred to higher level of care.

Ascension Borgess Medical Center (Trauma Coder Technology)

Coding charts is a time-consuming manual process in hospitals, particularly those already stretched for human resources. However, accurately collecting, coding and analyzing injury scoring data is essential to trauma program development and performance improvement. Automating this process can improve accuracy and efficiency. ___ purchased TraumaCoder® to help shore up their infrastructure.

- TraumaCoder® improved the accuracy and efficiency in the time it takes to code a trauma chart.
- The technology cut coding time by 5-10 minutes per chart.
- The facility has budgeted for the TraumaCoder® annual maintenance fee in order to sustain the gains made by the initial purchase.



|| PERFORMANCE IMPROVEMENT

Trauma systems are complex and require a great deal of collaboration across the continuum of prevention, response-including: dispatch, pre-hospital care and hospital care, and recovery in order to ensure an efficient system that gets the right patient to the right facility in the right amount of time. Performance Improvement is vital for an effective system. Monitoring, evaluating and improving the performance of the trauma system and trauma programs is the responsibility of all involved. There were three funded projects that addressed performance improvement.

Allegan County Central Dispatch (Automated Dispatch Protocol Software)

Allegan County Central Dispatch (ACCD) identified that the current process of using a flip card system for priority dispatch was cumbersome and could lead to potential errors. The manual quality assurance process was burdensome and took 19 hours per week to maintain minimum accreditation standards. ACCD received partial support of an automated dispatch protocol software program that assists in asking the best questions and dispatching the proper resources to emergency medical responses.

- Funds to complete the software purchases were matched by the Allegan County Medical Control Authority.
- Funds to complete the software purchases were matched by the Allegan County Medical Control Authority.
- Compliance with dispatch protocols were noticeably higher.
- The program also included targeted training, case review and feedback to call takers at least once per month.
- Ongoing software costs have been built into the budget to allow for the continuing use of the programs.

Our call center now has instant instructions available for patient care with best practices in place for first responder safety and proper prioritization.

Allegan County Central Dispatch
