Level One Trauma Center

ANNUAL REPORT 2013

ST. ELIZABETH HEALTH CENTER

Humility of Mary Health Partners

Dear Friends:

Our 2013 Annual Report is a story of progress. As a Level I trauma center, St. Elizabeth Health Center always cares for the most seriously injured patients in our region. Most minor injuries can be treated in community hospitals. Complex traumatic injuries need special intervention with special skills. More than ever, we stand ready with the necessary expertise and resources.

Trauma care cannot and should not rest. It should continually advance. We're educating the next generation of physicians and nurses with a passion for trauma care so they have the latest training and newest methods. We research, test and uncover new treatments that improve the quality of life for trauma survivors. This important work saves lives. A recent study found that injured patients who receive care at a Level I trauma center have a 25% lower risk of death.

We're also looking for ways to give people the tools they need to prevent injury in the first place. Our robust injury prevention program focuses on preventing falls and the dangers of distracted driving.

This report highlights the progress of our trauma program, along with key statistics. Of course, numbers alone don't tell the whole story. We welcome your comments or questions. Please call us at 330-480-3907.

Sincerely,

Brian S Gruber, MD, FACS
Director of Trauma/Critical Care Services

Daneen Mace-Vadjunec RN, MHHS, ONC
Program Director Trauma and Neuroscience

Mission Statement

Humility of Mary Health Partners extends the healing ministry of Jesus by improving the health of our communities with emphasis on people who are poor and under-served.

TOGETHER WE COMMIT TO:

Compassion: Our commitment to serve with mercy and tenderness.

Excellence: Our commitment to be the best in the quality of our services and the stewardship of our resources.

Human Dignity: Our commitment to value the diversity of all persons and to be respectful and inclusive of everyone.

Justice: Our commitment to act with integrity, honesty and truthfulness.

Sacredness of Life: Our commitment to reverence all life and creation.

Service: Our commitment to respond to those in need.

TRAUMA SERVICES MISSION STATEMENT

Trauma Services' mission is to reduce trauma-related death and disability and to assume a leadership role in development, evaluation and continuous quality improvement of trauma care.

Trauma Transfer Line 1-877-966-0662

24 hours a day, seven days a week

Make just one phone call to refer a patient

(Transportation will also be arranged if needed)

"One call does it all."

Staff 6

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Seated from left to right: Pattie Kountz, Heather Poch, Dr. Gregory Huang, Renee Reyes, Marina Hanes and Barb Hileman. *Standing:* Dr. Kenneth Ransom. Dr. Brian Gruber, Ben Melnykovich, Daneen Mace-Vadjunec, Laurie Flowers, Renee Merrell, Dr. Ronald Rhodes, Lexi Giansante, Gino DeChellis, Nancy Montwori, Elisha Chance, Susan Julian and Dr. Heath Dorion.

Trauma Faculty

Brian S. Gruber, MD, FACS
Director, Trauma/Critical Care Service
Clinical Assistant Professor of Surgery
Northeastern Ohio Universities College of Medicine & Pharmacy

Heath A. Dorion, MD, FACS
Assistant Director of Education, General Surgery
Clinical Assistant Professor of Surgery
Northeastern Ohio Universities College of Medicine & Pharmacy

Kenneth Ransom, MD, FACS
Assistant Director of Education, Osteopathic
Clinical Assistant Professor of Surgery
Northeastern Ohio University College of Medicine & Pharmacy

Ronald A. Rhodes, MD, FACS
Director of Education, General Surgery
Clinical Assistant Professor of Surgery
Northeastern Ohio Universities College of Medicine & Pharmacy

Gregory Huang, MD
Trauma/Critical Care Surgeon

Hiba Abdel-Aziz, MD
Trauma/Critical Care Surgeon

Trauma Program Staff

PROGRAM DIRECTOR

Daneen Mace-Vadjunec, RN, MHHS, ONC
Program Director Trauma and Neuroscience
Phone: 330-480-4417

NURSE PRACTITIONERS

Edward Cornman, RN, MSN, ACNP-BC

Laurie Flowers, RN, MSN, CCRN, CCNS
Phone: 330-480-2456

Patricia Kountz, RN, NP
Phone: 330-480-8876

Heather, Poch, RN, MSN, ACNP-BC
Phone: 330-397-5401

OUTREACH/INJURY PREVENTION COORDINATOR

M. Ben Melnykovich, RN, BSAS
Phone: 330-480-8877

TRAUMA RESEARCH COORDINATOR

Barbara Hileman, BA
Phone: 330-480-6302

Trauma Research

Elisha Chance, BSAS
Phone: 330-480-3107

Marina Hanes, BA
Phone: 330-480-3107

TRAUMA REGISTRY COORDINATOR

Renee Merrell, CAISS
Phone: 330-480-3880

TRAUMA CODERS

Nancy Montwori
Phone: 330-480-2963

Alexis Giansante
Phone: 330-480-2007

Gino DeChellis
Phone: 330-480-2466

ADMINISTRATIVE ASSISTANT

Renee Reyes
Phone: 330-480-3907

Why St. Elizabeth?

The Important Role of the Level I Trauma Center

Level I Trauma Centers allow for the quickest response possible to treat the severely injured. Our team is in a constant state of 24/7 readiness.

Few facilities have earned Level I Trauma designation. The specialized hospital facility must have enough personnel, resources, services, equipment and supplies to care for injured patients throughout all phases of their hospital stay, from resuscitation to discharge.

St. Elizabeth can provide prompt care in orthopaedic surgery, neurosurgery, plastic surgery and other specialties—whatever is needed to treat any level of trauma. We also have interventional radiology, surgery suite and critical care units standing by. In fact, our trauma team meets or exceeds a long list of designation criteria. This higher level of care benefits not only trauma victims, but also their families and friends.

THERE ARE ONLY 11 ACCREDITED LEVEL I ADULT TRAUMA CENTERS IN THE STATE OF OHIO.

St. Elizabeth remains the only one located between Cleveland, Pittsburgh and Akron.

To be recognized as a Trauma Center in Ohio, hospitals must comply with sections 4798.01 and 3727.101 of the Ohio Revised Code. American College of Surgeons (ACS) verified Trauma Centers must submit documentation of verification.

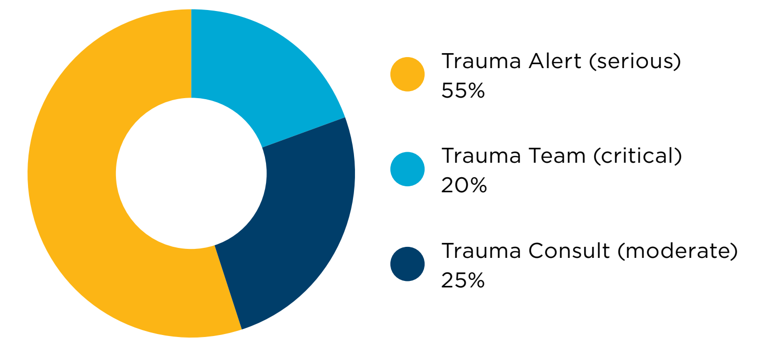
2,159 trauma patients treated and admitted

TRAUMA TEAM

As our EMS partners transport an injured patient to us, our trauma team is activated and ready for the moment the patient arrives at our door.

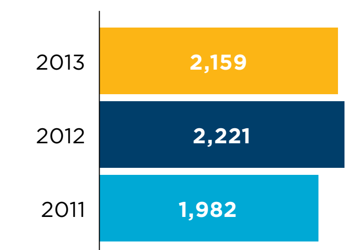
THREE-TIER RESPONSE

Choosing the right activation level is crucial to a trauma patient's care. Our emergency team relies on information from pre-hospital care providers to decide which level is best. To do this, they use pre-hospital triage and transfer guidelines established by the American College of Surgeons and the State of Ohio.

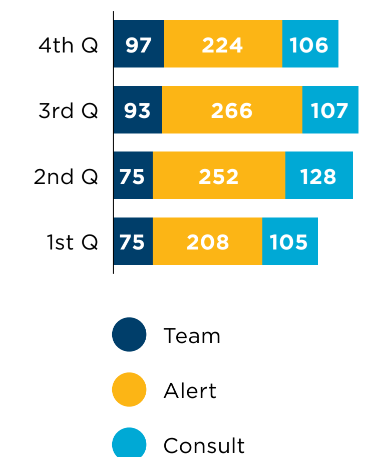


TRAUMA TEAM	ALERT
GCS less than or equal to 13 or GCS motor less than or equal to 4	Significant Mechanism
Systolic BP less than 90 adult or age specific hypotension with children	Ejection from vehicle
Respiratory rate less than 10 or greater than 29	Death in same vehicle
Endotracheal intubation	Extrication time greater than 20 minutes
Transfer from outlying facility receiving blood to maintain vital signs	Falls greater than 20 feet
Penetrating injury to head, neck, torso	Rollover
Flail chest	High-speed crash (greater than 40 mph)
Combination burn with trauma	Major auto deformity (greater than 20 inches)
2 or more long bone fractures	Intrusion into passenger compartment greater than 12 inches
Pelvic fracture	Pedestrian thrown or run over
Open and depressed skull fracture	ED Physician Discretion
Paralysis	Age greater than 55
Amputation proximal to wrist/ankle	Cardiac or respiratory disease
Major burn	Insulin dependent diabetes, cirrhosis or morbid obesity
Age greater than 64 or less than 5 with significant	Pregnancy
ED Physician Discretion	Immunosuppressed patients
	Bleeding disorder or on anticoagulants
	ED Physician Discretion

TRAUMA VOLUME



ACTIVATIONS BY QUARTER



Transport Methods

Better trauma care and better results hinge on teamwork. Many phases of trauma care need to work together seamlessly. And it begins with on-scene response and treatment.

TIME IS PRECIOUS

Ground ambulance and aeromedical crews need excellent communication and professional skills to give patients the best chance. We offer many educational programs for the EMS Community, most with accompanying CEUs. By helping paramedics, fire fighters and pre-hospital personnel gain these skills, we help create a strong network of emergency response. American College of Surgeons (ACS) verified Trauma Centers must submit documentation of verification.

85% patients brought by ground transport

7% patients brought by Air Medical Access

STAT MedEvac aircraft are equipped with the latest in lifesaving and advanced aviation technology. Based at Youngstown Eliser Airport, they handle the vast majority of our air transport patients.

45% transfer patients brought by Mobile ICU (MoICU)

The MoICU staff are specially-trained paramedics and intensive care nurses dedicated to providing our community with the best healthcare possible.

528 patients transferred to St. Elizabeth's Trauma Center from another hospital

EMS TRAUMA RUN EDUCATION

The Fifth Season Banquet Center

QUARTERLY SESSIONS

Trauma
Stroke, update
Prehospital, sepsis care
Cardiovascular, update

EMS Run Reviews are free and participants earn CE Certificates.

Emergency Services

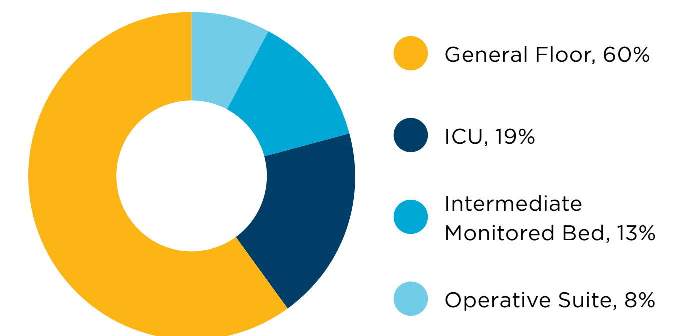
The emergency department at St. Elizabeth is a vital part of our Level I trauma center. Our 20,000+ square-foot facility is a full-service resource dedicated to prompt, compassionate care.

FEATURES INCLUDE:

- Subspecialists on-call every hour of every day: general surgeons, orthopaedics, neurosurgeons, anesthesiologists, radiologists and board-certified critical care physicians
- Dedicated trauma rooms with state-of-the-art digital radiology, fully integrated with the hospital's Picture Archiving Communication System (PACS)
- 24-hour Sexual Assault Nurse Examiner (SANE) coverage with a focus on the medical-forensic examination
- Nursing staff with certification in Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS), Trauma Nursing Core Course (TNCC) and Emergency Nurses Pediatric Course (ENPC).

more than 44,679 patients were treated by board-certified emergency doctors and staff

WHERE PATIENTS WERE ADMITTED FROM THE EMERGENCY DEPARTMENT:



Orthopaedic Trauma Services

Many trauma patients admitted as traumas have some type of musculoskeletal injury. Motor vehicle and motorcycle crashes, industrial accidents and falls can cause major pelvic and complex extremity fractures. The Orthopaedic Trauma Service treats these injuries as well as any structural problems resulting from the injury.

Orthopaedic surgeons are available 24 hours a day. Orthopaedic residents and physician assistants are also able to provide hands-on care. Whether they are dealing with a simple fracture, dislocations, open fractures, or complex pelvis fractures, their expertise provides the patient with quick and efficient care.

And once patients are released from the hospital, the orthopaedic clinic provides continued care.

Neurosurgical Services

Neurosurgical trauma can involve far more than the brain. Neurological Services diagnose and treat the entire nervous system, including the brain, spinal cord and spinal column. The team often consults with neurosurgeons who have extensive training in the diagnosis of all neurological disorders.

Our team of surgeons provide expert treatment and diagnosis for brain tumors degenerative spine disease, spinal fractures, lumbar stenosis, peripheral nerve disorders, trauma and other disorders. The trauma team is also aided by highly skilled support staff and state-of-the art technology.

Surgical Suites

State-of-the-art operating suites are designed for the patient with multiple injuries. Surgical suites and anesthesia staff are available 24/7/365.

36% of our trauma patients went to the operating room while in the hospital

Surgical Intensive Care Unit (SICU)

Some patients require fast-paced, high-acuity, specialty critical care. Our SICU is a 12 bed unit, two of which are reserved for pediatric trauma patients. Trauma is the most common reason for admission to the SICU.

22% of trauma patients were admitted to SICU

Our multidisciplinary team works together to provide excellent care. The unit has a strategic location—next to the emergency department, operative suites and recovery room. It is also strategically equipped with the most sophisticated life support technology available. For example, we can continuously monitor essential hemodynamic patient information. Clinical studies show that this type of monitoring significantly improves patient outcomes.

Everything needed to treat critically injured trauma patients is readily available 24/7.

We understand that it is very difficult to have a loved one in the intensive care unit. We promise to do our best to make the experience as stress-free as possible. We support family and patient-centered visiting and promote frequent rest and private periods.

Acute Rehabilitation Unit

St. Elizabeth's rehabilitation unit has 30 beds available every day for patients with complex rehabilitation needs. The unit is CARF accredited.

124 trauma patients were admitted to the rehabilitation unit before going home

Physical therapy helps with mobility, balance and safe transfer skills. Treatments are scheduled twice daily to help patients gain strength, restore muscle function, and improve balance and gait.

Occupational therapy helps to develop skills in self-care, homemaking, recreation, school and work.

Speech/language therapy helps with speech, language, memory, thinking and swallowing disorders.

Recreational therapy improves social, emotional and physical skills; helps with communicating thoughts and feelings, and develops self-awareness.

Rehabilitation nurses provide 24-hour nursing care with ongoing assessment, planning, intervention and evaluation of a wide range of medical and therapy issues.

Rehabilitation physicians provide expertise in medical functional issues and direct the interdisciplinary team in coordinating the patient and family plan.

Case management and social services provide individual discharge planning and help with insurance needs.

Psychology services help patients and their families adjust to the diagnosis and treatment of medical problems.

DID YOU KNOW?

Each patient has a personal care plan that includes three hours of therapy services per day. The plan of care is based on individual goals formed by the physician, rehab staff, nursing staff, the patient and his or her family.

Outpatient Rehabilitation

The outpatient physical therapy program serves patients with orthopaedic, neurologic and post-surgical diagnoses. To better serve our patients, we also offer specialty programs in sports medicine, aquatic therapy, pediatrics, industrial rehab and women's health. Our outpatient services are offered in the Youngstown, Warren, Austintown and Boardman.

Trauma Registry: How We Collect Our Data

A trauma registry is a sophisticated electronic database. It lays the statistical groundwork for quality assurance activities and can lead to better quality of care for trauma patients. It's an essential part of trauma care.

This database helps us collect, organize and analyze information on every trauma patient. We use this data to closely monitor the continuum of care, from injury prevention, to outcome measurement.

Our trauma registry manages data for more than 40,000 patients

Our registry also contributes data to the American College of Surgeons National Trauma Data Bank—the largest collection of the nation's trauma data ever assembled. Data is aggregated and used to produce annual reports, hospital benchmark reports and data quality reports.

HOW GOOD IS QUALITY OF THE DATA?

Every quarter, we go through a data validation process to improve the quality of data. We also hold regular education sessions. External data is validated by the National Trauma Data Bank and Ohio Trauma Registry before it's submitted.

Ohio hospitals are authorized by Ohio Law ORC 4765.06, Senate Bill 98 to submit trauma data to the State Trauma Registry. Data is submitted electronically quarterly, 90 days following the end of each quarter. The goal of the Ohio Trauma Registry is to provide data for development of public policy, healthcare education, injury prevention and research. Hospitals must participate in order to be eligible for the EMS/Trauma grant program, or to participate in DEMS funded programs.

Methods for Scoring Injury Severity

ABBREVIATED INJURY SCALE (AIS)

The AIS has been continuously improved since it was created. The current edition (AIS® 2005) involves hundreds of contributors in the USA, Canada, Australia, New Zealand and several European countries. The AIS® 2005 has completely restructured injury classifications for upper and lower extremities, and the pelvis. These body regions play a significant role in nonfatal long-term impairment and disability. The new classifications give researchers and investigators a tool to record injuries in these areas with greater precision and detail. Injuries are rated from 1 (minor) to 6 (fatal).

INJURY SEVERITY SCORE (ISS)

ISS is an anatomical scoring system that gives an overall score for trauma patients. The system starts with scores for injuries to different body regions (head/neck, face, thorax, abdomen and pelvic content, extremities, and external). The injury severity score is the sum of squares of the three highest injury scale scores. Scores go from 1 (minor injury) to 75 (lethal injury).

GLASGOW COMA SCALE (GCS)

GCS measures the level of consciousness in head injury patients. It looks at three factors: best eye response, best verbal response and best motor response. Scores range from 3 (worst) to 15 (best).

REVISED TRAUMA SCORE (RTS)

RTS measures other physiological factors outside of anatomical injury scores.

TRAUMA AND INJURY SEVERITY (TRISS)

A combination of an anatomical measure (ISS), a physiological measure (RTS) and the patient's ability to withstand injury (age) by type of injury (blunt/penetrating). A probability of survival (Ps) is determined using a logistic regression model.

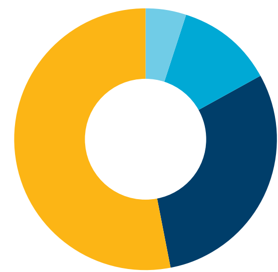
DID YOU KNOW?

Distracted driving has become a deadly epidemic on America's roads. Teens are especially vulnerable because of their inexperience behind the wheel and peer pressure. Behind the statistics are real families who have been devastated by these tragedies. The U.S. Department of Transportation is working to spread awareness of this serious problem on a national level and help communities establish appropriate legislation and enforcement standards.

Please join us in fighting for the lives of young people.

Mechanism of Injury

MOST COMMON MECHANISM OF INJURY AMONG 2,079 ADULT TRAUMA PATIENTS:

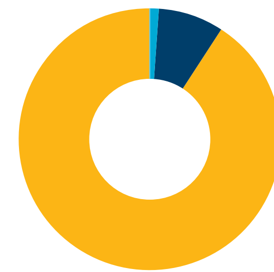


- Fall, 53%
- Motor Vehicle Traffic, 30%
- Assault and Gunshot, 12%
- Motorcycle Traffic, 5%

53% of falls involve geriatric patients

Falls continue to be the number one mechanism of injury.

INJURIES OF ALL TRAUMA PATIENTS:



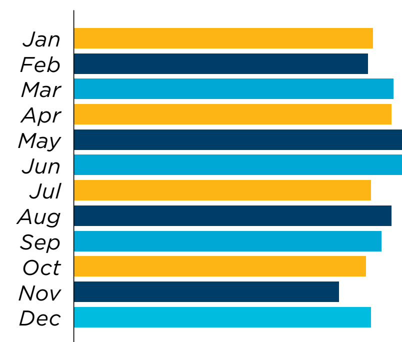
- Blunt, 91%
- Penetrating, 8%
- Burns, 1%
- Asphyxial, 0.2%

Blunt trauma is caused by impact, injury or physical attack that does not penetrate the skin (such as a steering wheel impact in a car crash).

Penetrating trauma is an injury that pierces the skin (such as a bullet or knife).

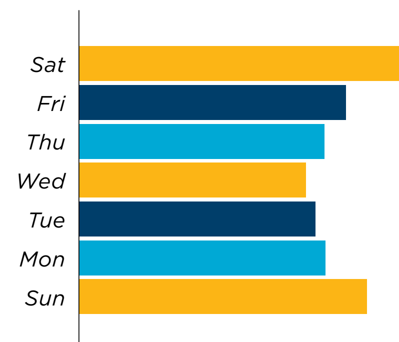
ADMISSIONS BY MONTH

Trauma admissions were higher in the warmer months, with a peak in May.



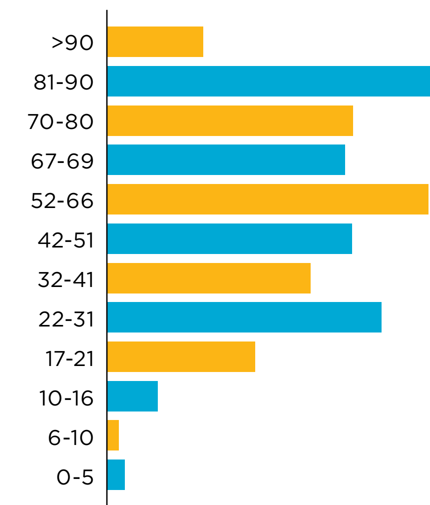
ADMISSIONS BY DAY

Saturdays and Sundays were the busiest days of the week.



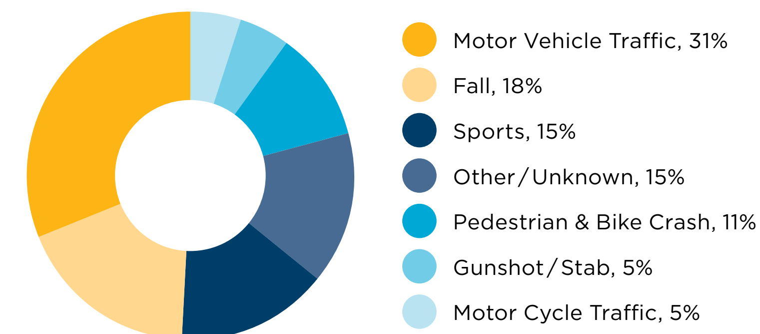
Special Populations

AGE GROUPS



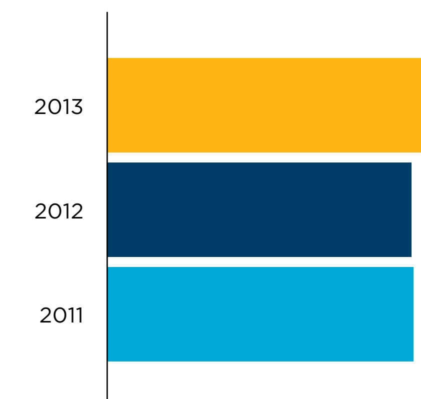
PEDIATRIC TRAUMA (≤16 YEARS OF AGE)

Injury results in more deaths in children and adolescents than all other causes combined. For this group, more years of potential life are lost to injury than to sudden infant death syndrome, cancer and infectious diseases combined. Every year, an estimated one in four children suffers an unintentional injury that requires medical care.



GERIATRIC TRAUMA

As the population ages, the volume of geriatric trauma is also increasing. Our geriatric subcommittee focuses on optimizing care for these patients. The team understands that this group has lower physical reserves, a higher number of serious conditions and more complication risk. This information is shared with other hospitals to improve geriatric care in the entire community.

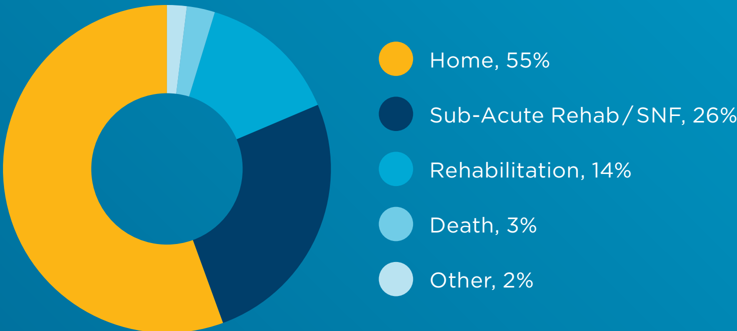


4% of all trauma patients are pediatric

DID YOU KNOW?

The average length of stay in a trauma center is 4.5 days.

Ongoing Care



Trauma Clinic

After they're discharged, patients may receive follow-up care at St. Elizabeth's Ambulatory Care Center. The trauma clinic staff includes the same Advanced Practice Nurses and trauma surgeons who were on the care team during the hospital stay. So the patient receives complete continuity of care.

Services at the trauma clinic include wound care, suture and staple removal, and help with pain management. We continually assess and evaluate how the patient is progressing on the road to recovery. The trauma clinic staff can also facilitate referrals to other health care providers, such as neurosurgery, orthopedic surgery and physical/occupational therapy.

Concussion Management Clinic

Most people with concussion recover quickly. But some take longer or suffer residual effects. The Center for Disease Control recommends that anyone who thinks they have sustained a concussion should see a healthcare provider with advanced training in concussion management. This is often a neurosurgeon or rehabilitation specialist.

Early intervention and education from a caregiver trained in concussion management can mean a quicker recovery and provide education to the patient about avoiding activities that may prolong recovery.

At the HMHP Concussion Clinic, we offer neuropsychological tests, symptom management, activity restriction education and rehabilitation therapy. Our team of physiatrists and athletic trainers use ImPACT neuropsychological testing and can interpret results on site. We also keep the primary care physician informed of any changes throughout the patient's recovery.

Wound Care Center

The Wound Care Center is a team of doctors and nurses dedicated to treating wounds. Some patients have wounds that resist healing by traditional means. Hyperbaric Oxygen Therapy, a treatment that uses oxygen-enriched blood to aid in healing wounds, is available to these patients.

Preventing Trauma Before it Happens

The best cure for trauma is to prevent it! Along with our extensive expertise in treating victims of trauma, we're also committed to preventing traumatic injuries.

Education does make a difference. One example is Safety and Violence Education (SAVE), which targets at-risk teens in the five county area. SAVE exposes teens to the workings of the Level I Trauma Center, touring the trauma bay, intensive care area and morgue. The goal is to show them the ramifications and outcomes of making wrong choices.

We work with other community agencies and organizations, such as the Victim Impact Panel (VIP) held in Canfield every month. In cooperation with the local MADD chapter and the Mahoning County Sheriff's office, VIP hopes to reach teens before a fatal accident happens. We also use pre-prom assemblies, programs and mock crash presentations to show the consequences of drinking and driving.

Also, since falls rate as our number one mechanism of injury, we lead a Falls Prevention program for the elderly and their families throughout the community.

The injury prevention team collaborates many of these events with the Mahoning County Safe Communities Coalition, as well as a variety of local EMS, fire and police agencies.

Trauma Research

Trauma Services has a strong commitment to the research and promotion of evidence-based practices. Research projects in which Trauma Services participates or leads for 2013 include:

Huang, Biteman, Marchand, Hanes. "Combined portal vein and hepatic artery injury after motor vehicle accident." *SCCM*. 10/13.

Biteman. "Situs inversus, malrotations and preduodenal portal vein: A laparoscopic adventure." *ACS Clinical Congress*. 10/13.

Vanek VW. "American Society of Enteral and Parenteral Nutrition (A.S.P.E.N.) Novel Nutrient Task Force – Why, How, and When." *Clinical Nutrition Week 2013*, Phoenix, AZ, 2/10/2013.

Vanek VW. "Background and Evidence Used in Formulating the A.S.P.E.N. Alternative IVFE Position Paper." *Clinical Nutrition Week 2013*, Phoenix, AZ, 2/10/2013.

Vanek VW. "Providing Nutrition Support in the EMR Era: the Good, the Bad, and the Ugly!" *Clinical Nutrition Week 2013*, Phoenix, AZ, 2/10/2013.

PHYSICIAN AND NURSE PEER REVIEWED ARTICLES PUBLISHED IN 2013

Dunham CM, Chirichella TJ, Martin J, Ferrari J, Gruber BS, Hileman BM, Merrell R, Luchs B. "In emergently ventilated trauma patients, end-tidal CO2 and cardiac output are associated and decrease with hemorrhage, brainstem dysfunction, and death." *BMC Anesthesiology*. 2013;12:20.

Dorion, Hileman. "Abdominal wall reconstruction following strangulated recurrent incisional hernia during pregnancy." *J Med Cases*. 2013;4(12):796-798.

Blake S, Dean D, Chance E. "Antecubital venipuncture resulting in compartment syndrome of the anterior brachium." *JBJS*. 2013;3:e12.

Huang G. Chance E. "When Pradaxa and trauma collide: A brief report." *Am Surg*. 2013; 79(1):113-114.

Kupensky D, Hileman B, Chance E, Jones S. "Mood-altering Drugs (MAD) in the Trauma Population: Hidden Dangers, Deadly Combinations." *J Trauma Nurs*. 2013;20:117-124.

Zielinski SM, Bouwmans CA, Heetveld MJ, Bhandari M, Patka P, Van Lieshout EM, on behalf of the FAITH trial investigators (includes Shaer J, Schrickel T, Hileman BM). "The societal costs of femoral neck fracture patients treated with internal fixation." In press: *Osteoporosis Int.* 2013 Sep 27. Epub ahead of print. Published.

Humility of Mary Health Partners and Lifebanc Partnership

Trauma Services and hospital staff are integral parts of the life-giving process. Grieving for a loved one is never easy, but choosing to donate organs may help patients and their families through the pain.

17 very special patients gave another person the chance at life. That's up 13% from 2012.

HMHP sponsored a "Donate Life" flag raising at St. Elizabeth Hospital, an emotion-filled ending to National Donate Life month. Lifebanc, hospital staff members, recipients and donor families attended the service to acknowledge those touched by organ, eye and tissue donation.

A tree donated by Marcus and Eric Merrell, in memory of their father Steven and all donors.

Disaster Preparedness

St. Elizabeth uses an "all hazards" approach for managing disaster situations result in mass causality, mass fatality, contaminated patients, contagious patients, structural facility damage or loss of business operations.

From workplace violence and chemical disasters to floods, tornadoes and storms, Trauma Services plays a vital role in disaster preparedness. We continually work with local public and private entities to obtain disaster support, supplies and equipment. St. Elizabeth also has established close working relationships with the Mahoning and Trumbull County Emergency Management Agencies (EMA). We conduct several exercises every year and participate with other area hospitals as a region.

Finally, St. Elizabeth staff continues to receive extra decontamination training and weapons of mass destruction education.

Data References

HMHP Trauma Registry

Renee Merrell, Trauma Registry Coordinator

National Trauma Data Bank

Center for Disease Control and Prevention

U.S. Department of Health and Human Services Center for Disease Control and Prevention

Office of Technology Assessment, U.S. Congress

www.lifebanc.org/organization-partners

www.facs.org/trauma/verified.html

www.ncbi.nlm.nih.gov/pubmed/11435197

www.census.gov/population

www.prweb.com

www.cdc.gov/TraumaCare

KES Foundation

Kyrsten Elizabeth Studer's short life was taken fourteen days before her 15th birthday. She was walking with friends on a Friday night, when she was struck by a car. The shock and sadness affected her family, close friends and the entire community.

Kyrsten played soccer, danced, cheered and sold Girl Scout cookies. She became a high school cheerleader through absolute dedication and perseverance. She tried to be the best student she could and she succeeded. Her life was full of goodness!

Her death provoked response from every neighboring community. Kyrsten's positive life spirit continues to benefit others. The KES Foundation funds and, in conjunction with the trauma services department, distributes animals, blankets, pillows and wrist bands to our trauma patients.

Shortly before her death, Kyrsten wrote down these words from "I Hope You Dance," written by Mark D. Sanders and Tia Sillers, and recorded by country singer Lee Ann Womack:

"I hope you still feel small when you stand beside the ocean,
Whenever one door closes I hope one more opens,
Promise me that you'll give faith a fighting chance,
And when you get the choice to sit it out or dance

Dance.....I hope you dance"