NOTS

NORTHERN OHIO TRAUMA SYSTEM

right patient,
right place,
right time

2010
Northern Ohio Trauma System

ANNUAL REPORT

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2010 ANNUAL REPORT

It is with great pleasure that we provide you with our first annual NOTS report. We are distributing our first annual report at the inaugural NOTS Trauma Symposium. NOTS stands for the Northern Ohio Trauma System which began in January of 2010. It is collaboration with the Cleveland Clinic Hospitals and MetroHealth Medical Center with involvement from regional Emergency Medical Services.

The goal of this report is to provide the region with information concerning the disease of trauma. As the Medical Director of NOTS and the Trauma Director of MetroHealth Medical Center, I am committed to the mission of NOTS and look forward to our continued goal of improving the care of the injured patient.

In your service,

Jeffrey A. Claridge, MD, MS, FACS

The mission of NOTS is:

To provide the highest quality of care to trauma patients across the region by rigorously evaluating and improving outcomes, optimizing resources, and providing education across the region utilizing a collaborative approach with hospitals, emergency medical services, and the public health services.

OVERVIEW

Mr. Mark J. Moran, The MetroHealth System President and CEO, and Dr. Toby Cosgrove, Cleveland Clinic President and CEO, began collaboration on developing a regional trauma network a number of years ago. "This is the best way for us to be responsible with the region's resources," said Mr. Mark Moran. "There are a lot of high-cost resources needed to serve trauma and to stand ready for action. By working together, we can understand how best to deploy those resources and make sure there aren't any gaps in coverage." Dr. Cosgrove stated, "The most obvious thing was to not try to compete, but to collaborate."

Dr. Jeffrey Claridge was named the Medical Director of NOTS in January 2010, and within six months Dr. Michael Nowak, Regional Data Manager, Cheryl Hawkins, Administrative Secretary, and Deb Allen, Trauma Program Manager were hired.

The NOTS network is open to all hospitals and encourages collaboration with area facilities.
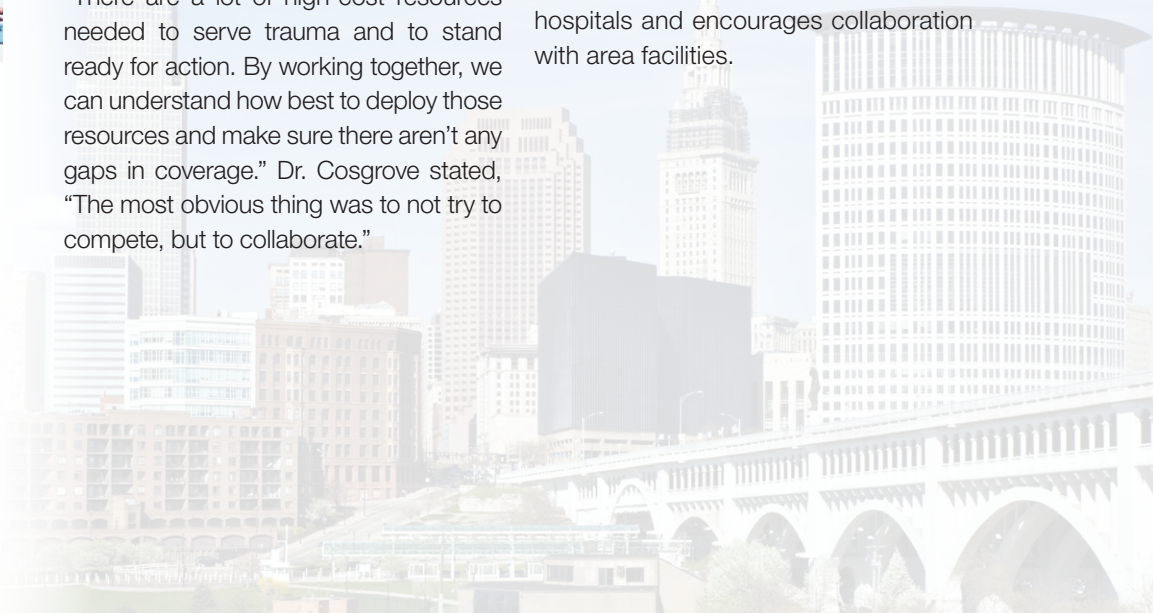
HISTORY OF NOTS

- Created in a joint collaboration between Mr. Mark Moran, President and CEO of The MetroHealth System, and Dr. Toby Cosgrove, President and CEO of Cleveland Clinic.

- Official start of NOTS began with the hiring of Dr. Jeffrey Claridge in January 2010.

- Additional staff added during the spring and summer of 2010: Cheryl Hawkins, Administrative Secretary; Dr. Michael Nowak, Regional Data Manager; Deb Allen, Trauma Program Manager.

- Spring 2010, the Mission Statement and 2010-2011 goals were approved by the NOTS Board.

- Summer 2010, initiation and development of multiple advisory subcommittees:
  - Quality/Performance Improvement
  - Protocol Development
  - EMS Advisory Committee
  - Education
  - Injury Prevention

  - Trauma Program Managers' Advisory Committee
  - Trauma Registry
  - Research
  - Disaster Management

- Developing and implementing evidence based protocols are a conscientious, explicit, and judicious goal of the Northern Ohio Trauma System. We began by implementing a non-trauma center triage protocol in 2010 and continued with patient management protocols in 2011. Our goal is to continue to develop, implement, reassess and evaluate protocols with the objective of improving the care and outcome of the trauma patient.

- June 2011, under the recommendations of Cleveland Mayor, Frank G. Jackson, and Cuyahoga County Executive, Ed FitzGerald, two public trustees were appointed to the NOTS Advisory Board: Mr. Norberto Colón and Commissioner Edward J. Eckart.

- NOTS will continue to develop protocols, increase trauma education, and improve injury prevention programs in the community along with increasing trauma research.
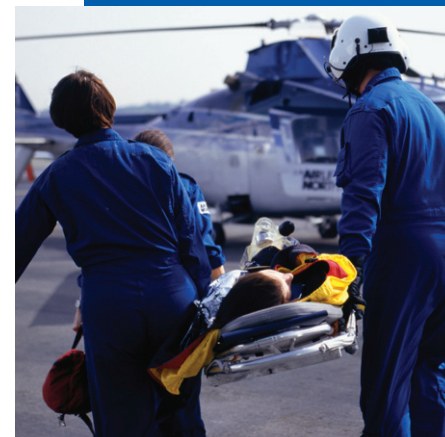
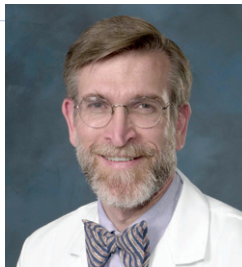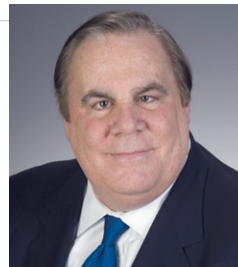# NOTS BOARD MEMBERS
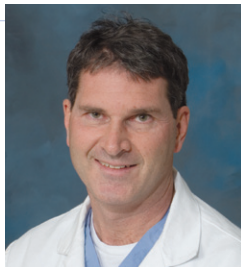
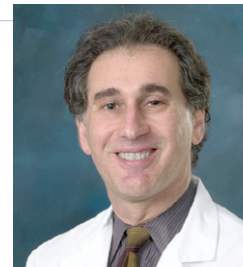Dr. Brendan M. Patterson
Chairman

Dr. David L. Bronson

Dr. Alfred F. Connors, Jr.

Mr. Fred M. DeGrandis

Dr. Charles L. Emerman

Mr. James Bryant

Commissioner
Edward J. Eckart

Mr. Terry Allan

Mr. Norberto Colón

PARTICIPATING HOSPITALS

TRAUMA CENTERS

MetroHealth Medical Center
Level I Adult Trauma Center,
Level II Pediatric Trauma Center

2500 MetroHealth Drive
Cleveland, OH 44109
http://www.metrohealth.org/

Medical Director of Trauma:
Dr. Jeffrey Claridge

Trauma Program Manager:
Patricia Wilczewski

Fairview Hospital
Level II Adult Trauma Center

18101 Lorain Avenue
Cleveland, OH 44111
http://www.fairviewhospital.org/

Medical Director of Trauma:
Dr. Richard Treat

Trauma Program Manager:
Bernadette Szmigielski

Hillcrest Hospital
Level II Adult Trauma Center

6780 Mayfield Road
Mayfield Heights, OH 44124
http://www.hillcresthospital.org/

Medical Director of Trauma:
Dr. Daniel Borison

Trauma Program Manager:
Mary Anne Edwards

MetroHealth Medical Center

Fairview Hospital

Hillcrest Hospital

PARTICIPATING HOSPITALS

Euclid Hospital
1890 Lake Shore Blvd.
Euclid, OH 44119
http://www.euclidhospital.org/

Lakewood Hospital
14519 Detroit Road
Lakewood, OH 44107
http://www.lakewoodhospital.org/

Lutheran Hospital
1730 West 25th Street
Cleveland, OH 44113
http://www.lutheranhospital.org/

Cleveland Clinic Main Campus
9500 Euclid Avenue
Cleveland, OH 44106
http://my.clevelandclinic.org/default.aspx

Marymount Hospital
12300 McCracken Road
Garfield Heights, OH 44125
http://www.marymount.org/

Medina General Hospital
1000 East Washington Street
Medina, OH 44256
http://medinahospital.org/

South Pointe Hospital
20000 Harvard Avenue
Cleveland, OH 44122
http://www.southpointehospital.org/

Ashtabula County Medical Center
2420 Lake Road
Ashtabula, OH 44004
http://www.acmchealth.org/

WHY IT'S IMPORTANT TO HAVE A TRAUMA SYSTEM IN THE CLEVELAND AREA

- Trauma is the leading cause of death for ages 1-34.

- Trauma is the 3rd leading cause of death for ages 35-44.

- Trauma is the 5th leading cause of death in all age groups.

- Traumatic injuries cause the loss of productive work years more than any disease.

- Trauma systems, statewide or regional, can reduce the death rate anywhere from 10% to 20%.

According to the National Highway Traffic Safety Administration, a trauma system is an organized, coordinated effort in a defined geographic area that delivers the full range of care to all injured patients and is integrated with the local public health system. The true value of a trauma system is derived from the seamless transition between each phase of care, integrating existing resources to achieve improved patient outcomes. Success of a trauma system is largely determined by the degree to which it is supported by public policy. Trauma systems are based on the unique requirements of the population they serve.

"If a disease were killing our young at the rate unintentional injuries are, the public would be outraged and demand that this killer be stopped."

C. Everett Koop, MD ScDC, ScD
Former US Surgeon General

TRAUMA DATA PROLOGUE

A key goal of NOTS is to have a regionalized trauma data repository. This data will allow us to measure outcomes and improvements across the region. The graphs and figures represent a compilation of data from the trauma hospitals.

This data is collected as a requirement of the American College of Surgeons for trauma center verification. The data collected is stored in the hospital's trauma registry. The American College of Surgeons mandates that the registry data be sent annually to a national data repository. The State of Ohio also requires data submissions; however, the State and the College have different data elements and different requirements for inclusion. For example, the College requires inclusion of all trauma admissions while the State requirement is admissions with a length of stay of 48 hours or greater. In addition, the State of Ohio requires that trauma registry data be sent to the State on a quarterly basis.

The registry is maintained by specially trained trauma registrars; besides ICD-9 coding, these registrars must also master a specialized type of coding specific to injuries. This method of coding is called AIS (Abbreviated Injury Scale) coding which results in the Injury Severity Score or ISS. The ISS score is used to estimate the overall severity of the injuries.

While each trauma registry collects the core variables, they often include data that is unique to their institutions. These unique variables usually begin as a quality filter and become incorporated into the system. Other types of information collected can be traced to a type of injury specific to the hospital's location. As we move forward as a network, the uniqueness of the trauma registries will present challenges as we build a system-wide trauma repository, but it will also allow us the opportunity to appreciate the nuances of each facility.

Trauma activity is defined as the number of patients entered into the trauma database from the five trauma centers in 2008, 2009, and 2010. Differences in the inclusion criteria for data abstraction among the trauma centers are reflected in this report. Prior to 2010, MetroHealth's trauma registry abstracted only patients who were inpatient admissions to their facility regardless if the trauma service was involved in their care in the Emergency Department or not. However, the other facilities may have included patients cared for by the trauma service in the Emergency Department but were discharged to home and did not require an inpatient admission. This difference in inclusion criteria among the various trauma centers reflects an under-representation of volume at MetroHealth Medical Center.

TRAUMA VOLUMES BY AGE

In 2010 a total of 6,921 patients were entered into the NOTS trauma registry. The table below illustrates the distribution of patients by age. It is important to note that trauma injuries happen across all ages.
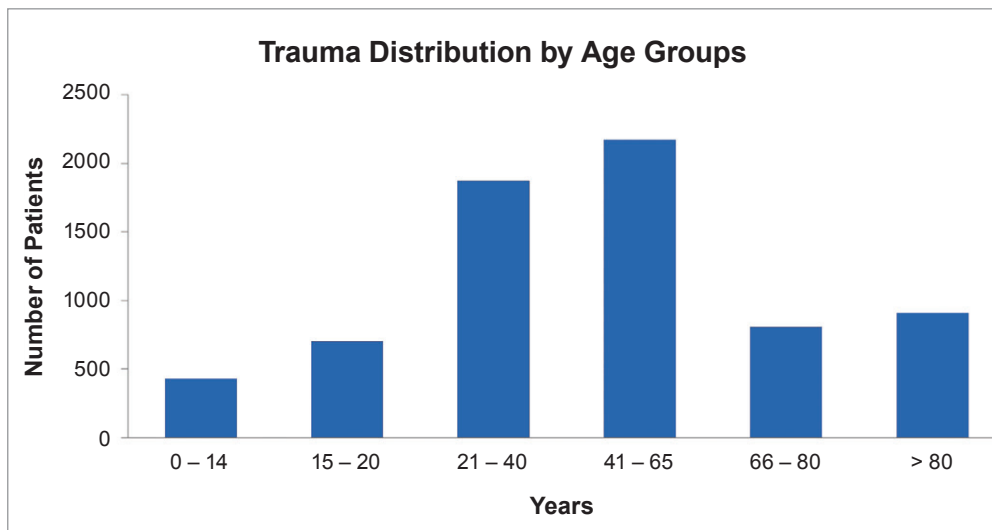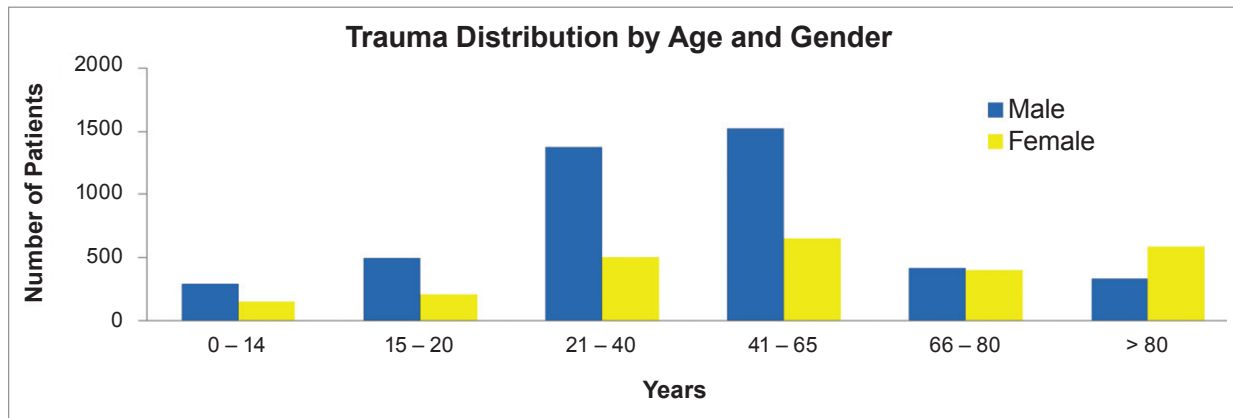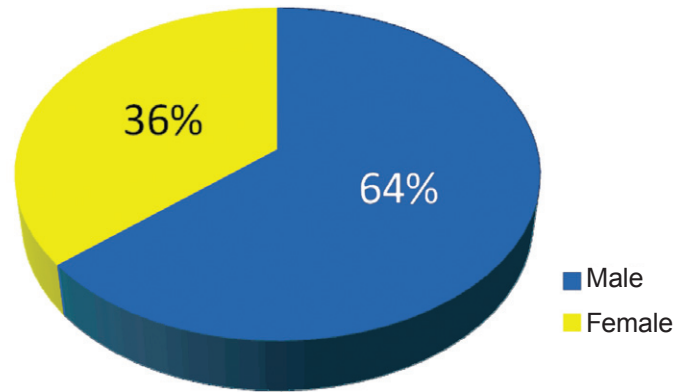
Trauma Distribution by Age Groups

Data Source: Northern Ohio Trauma System Registry

*MetroHealth Trauma Registry did not include trauma cases that were discharged to home from the Emergency Department.

TRAUMA BY GENDER

Trauma is more common in men, especially when they are younger. The overall percent by gender is represented in the pie graph. The graph below shows the distribution of trauma by age and gender. It is interesting to note that trauma in women is more common later in life.

36%

64%

■ Male
■ Female

Trauma Distribution by Age and Gender

Number of Patients

■ Male
■ Female

| Years | 0 – 14 | 15 – 20 | 21 – 40 | 41 – 65 | 66 – 80 | > 80 |

Data Source: Northern Ohio Trauma System Registry

*MetroHealth Trauma Registry did not include trauma cases that were discharged to home from the Emergency Department.

MODE OF ARRIVAL

The following graph demonstrates the mode by which patients arrived to the hospital. The Other category includes: taxis, arrived by personal car, police cars, and unknown/ undocumented mode.

■ EMS Unit

■ Helicopter
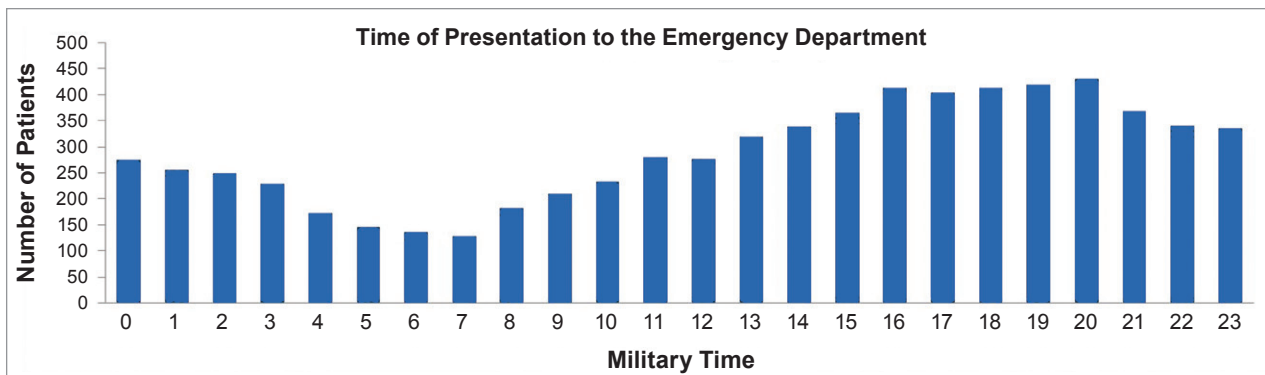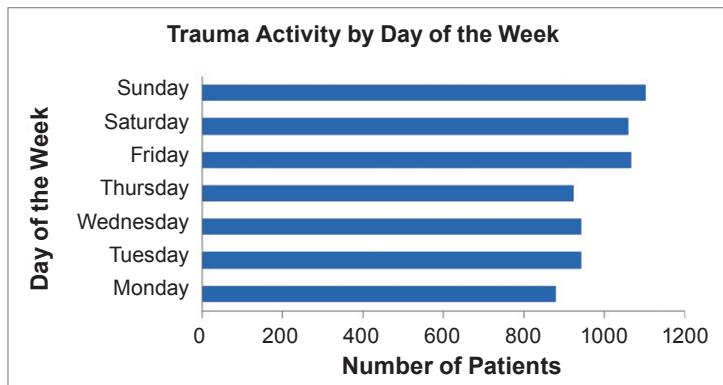
■ Fire Squad

■ Other

71%

16%

12%

1%
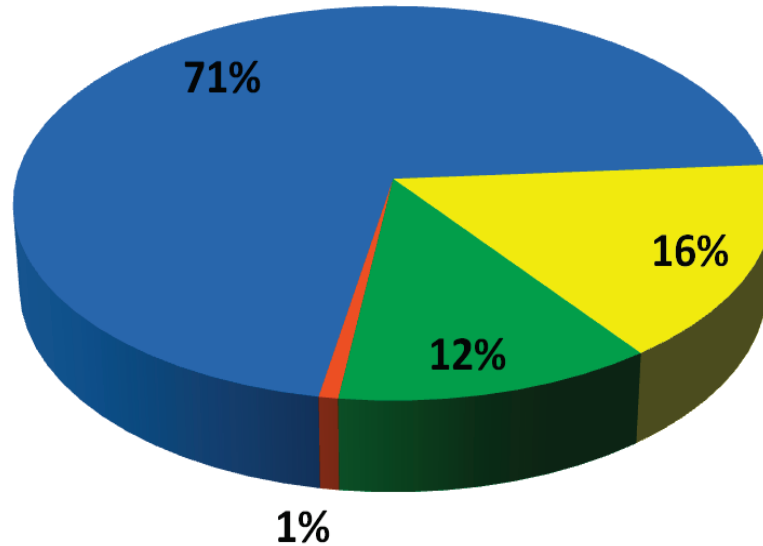
Data Source: Ohio Trauma System Registry

MetroHealth Trauma Registry did not include trauma cases that were discharged to home from the Emergency Department.

VOLUMES BY DAY AND TIME

An evaluation of trauma activity by day demonstrates that Friday, Saturday, and Sunday are the busiest days. It is surprising to notice that although these days are busy, the differences are only about 20%.

The second graph demonstrates the time of day that trauma patients arrive in the Emergency Department. The peak times are early in the evening.

Trauma Activity by Day of the Week

Time of Presentation to the Emergency Department

Data Source: Northern Ohio Trauma System Registry

MetroHealth Trauma Registry did not include trauma cases that were discharged to home from the Emergency Department.

VOLUMES BY MONTH

There is seasonality to trauma. This graph demonstrates the volume of trauma activity seen at the NOTS hospitals across the year. The busiest months are the summer months. The last three years of data are illustrated here.
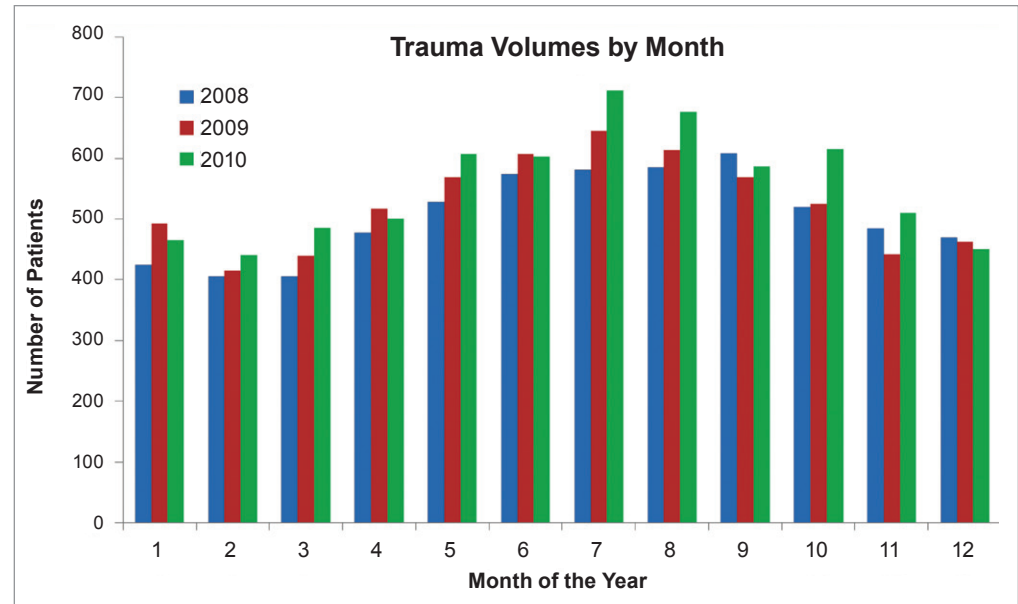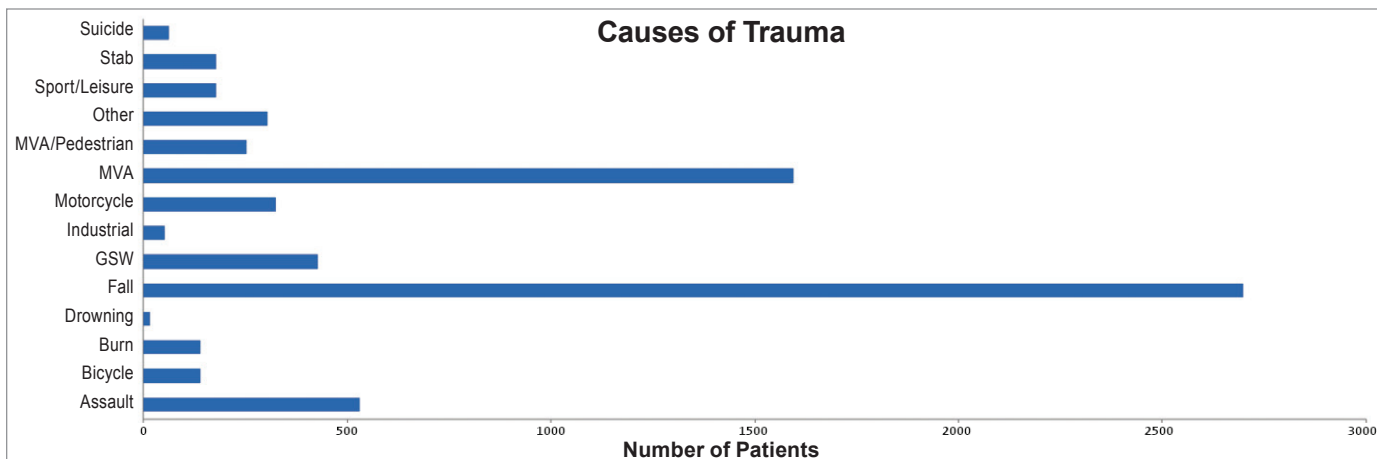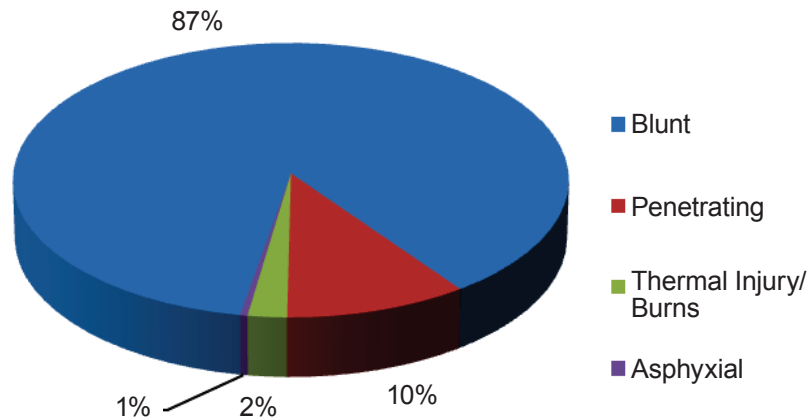

Data Source: Northern Ohio Trauma System Registry

*MetroHealth Trauma Registry did not include trauma cases that were discharged to home from the Emergency Department.

TYPES OF TRAUMA

Trauma is characterized in a number of ways. The simplest is to divide it into four categories. These include blunt, penetrating, thermal injuries/burns, and asphyxia. The pie chart shows the percentages of each. The second table shows further breakdown of the 6,921 traumas by more specific causes for the following years: 2008, 2009, and 2010.

87%

- Blunt
- Penetrating
- Thermal Injury/ Burns
- Asphyxial

1%   2%   10%

Causes of Trauma

Suicide
Stab
Sport/Leisure
Other
MVA/Pedestrian
MVA
Motorcycle
Industrial
GSW
Fall
Drowning
Burn
Bicycle
Assault

0   500   1000   1500   2000   2500   3000
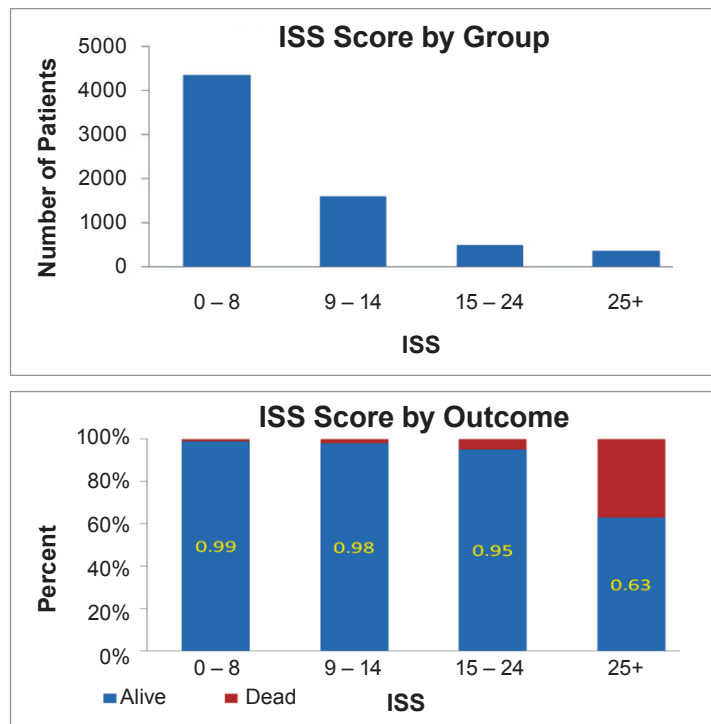
Number of Patients

Data Source: Northern Ohio Trauma System Registry

*MetroHealth Trauma Registry did not include trauma cases that were discharged to home from the Emergency Department.

MORTALITY, INJURY SEVERITY SCORE AND TRAUMA

Injury Severity Score (ISS) was developed initially to quantify blunt trauma. However, it is also used for penetrating injuries. Simply put, the higher the ISS the more injured the patient. It is well accepted that an ISS of < 9 is considered to be minimal trauma, an ISS of 9–14 is considered minor trauma, an ISS of 15–24 is considered moderate trauma, and 25 and greater is considered to be major trauma. ISS is also highly associated with mortality. The table to the right shows the distribution of ISS seen at the NOTS hospitals for the following years: 2008, 2009, and 2010.

The overall mortality for all 6,921 patients seen at NOTS hospitals was 3.4%. Thus 236 patients died as a result of their trauma. The table to the right demonstrates the survival and mortality rates broken down by ISS. The highest mortality rate was seen in patients with an ISS of 25 or greater. The mortality rate for these patients was 37%.

**ISS Score by Group**

ISS Score by Outcome

Data Source: Northern Ohio Trauma System Registry

MetroHealth Trauma Registry did not include trauma cases that were discharged to home from the Emergency Department.

VOLUMES BY NOTS TRAUMA CENTERS

The table here shows the trauma volumes over the past three years at the various NOTS trauma centers. It is important to note that Lakewood Hospital is no longer a designated trauma center. In 2010 Lakewood Hospital dropped its trauma center designation. Fairview, Hillcrest, and Huron were all Level II designated trauma centers from 2008 through 2010. MetroHealth is the region's Level I trauma center for adults and Level II center for pediatric trauma
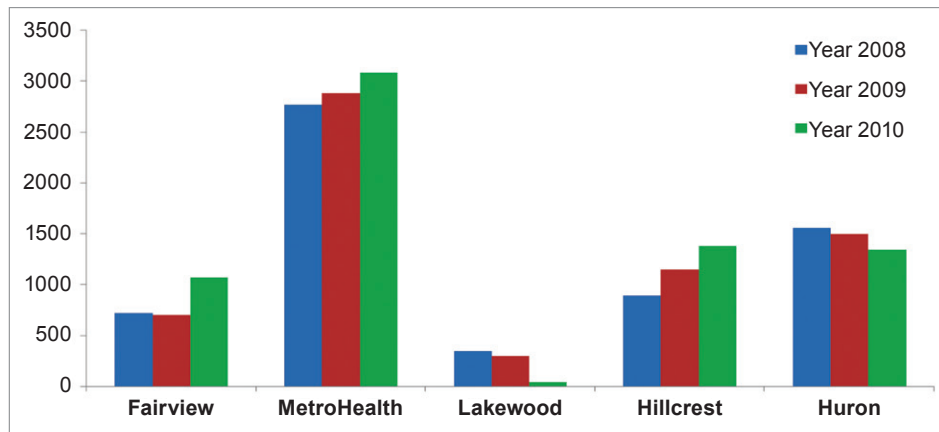
Data Source: Northern Ohio Trauma System Registry

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CONCLUSION

On behalf of Dr. Jeffrey Claridge, Deb Allen, Dr. Michael Nowak and Cheryl Hawkins, we thank you for your support as we continue to work toward providing the best possible care for trauma patients in our area.

For more information regarding NOTS, please contact:

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Visit our website at northernohiotraumasystem.org

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