

## INOVA REGIONAL TRAUMA CENTER 2 0 0 6 A N N U A L R E P 0 R T



NORTHERN VIRGINIA'S ONLY LEVEL 1 TRAUMA CENTER



# THEN & NOW.





Samir M. Fakhry, M.D., FACS, Chief, Trauma Services; Arthur L. Trask, M.D., FACS, Former Chief, Trauma Services; Russell P. Seneca, M.D., FACS, First Chief, Trauma Services

Our Annual Report this year focuses on where we were and where we are now. I am in my 10th year as chief of trauma services at Inova Regional Trauma Center but I have been here for less than half its history. In 1983, our hospital was first designated a Level 1 trauma center by the Commonwealth of Virginia. The first chief of trauma was Dr. Russell Seneca. He was succeeded in 1991 by Dr. Arthur Trask, the first full-time chief of trauma at Fairfax. Under Dr. Trask's leadership, we attained Level 1 verification by the American College of Surgeons Committee on Trauma (ACS COT) in 1993. We have been visited every three years since that time by both the state and the ACS for re-inspection and have maintained our Level 1 designation each time. Now among the country's largest trauma centers, we are well-recognized regionally and nationally for excellence in patient care, research and education.

Many things have changed over the years at Inova Regional Trauma Center. We have many more patients. Our acuity is higher. We have more trauma surgeons, mature research and injury prevention programs, and we participate actively in our own surgical residency program and the regional medical school campus. But some things have definitely not changed: our commitment to the highest quality of care, keeping strong ties to our community, a collaborative team approach to care, and effective collaboration between our full-time and community surgeons.

One especially important event occurred this year. Maureen Waller, director of trauma services at Inova Fairfax Hospital, retired after a distinguished career spanning 23 years at this institution. For those of us who knew her well, she was the heart and soul of the trauma program at Inova Fairfax Hospital, working tirelessly to advocate for trauma care and shepherding the service through the myriad challenges of setting up an ACS COT Level 1 program and maintaining it through the years. She will be doing other good work in Florida with her husband, Bob. We will miss her. She leaves behind a strong program filled with capable individuals who share her passion for trauma care.

As we look to the future, there are more challenges ahead. There are also many rewards and much to look forward to. Our community continues to grow, our hospital system is solid and our trauma team is as strong as ever. Denice Greene has taken over as director and brings great experience and commitment to the position. In the decade to come, I have every confidence that Inova Regional Trauma Center will continue its outstanding record of service to the community, excellence in patient care and leadership in research and education. We look forward to working with our many partners to fulfill our mission of delivering the very best in trauma care to our community.

Samir M. Fakhry MD FACS / Chief, Trauma and Surgical Critical Care Inova Regional Trauma Center Inova Fairfax Hospital

## What is the Inova Regional Trauma Center?

Inova Regional Trauma Center, based at Inova Fairfax Hospital, is Northern Virginia's only Level 1 trauma center for both adults and children. It is also the only trauma center in Virginia certified by the American College of Surgeons. A classification as "Level 1" means that Inova's trauma center provides the highest level of specialty expertise and meets strict national standards.

At the trauma center, specialized surgeons, anesthesiologists, physician specialists, nurses, operating rooms and resuscitation equipment are available around the clock, 365 days a year, to treat life-threatening injuries ranging from car crashes to gunshot wounds.

Inova Regional Trauma Center admits about 2,300 pediatric and adult trauma patients annually. Most come from Fairfax County, but some are brought in from surrounding counties and from Maryland and West Virginia. The trauma center treats victims of motor vehicle crashes, falls, industrial accidents and violence. Burn patients are stabilized and then transferred to a burn center.

### The Impact of Trauma

Traumatic injury accounts for about 140,000 deaths per year, and is the leading cause of death in the United States for ages 1-34. Between 10-13 times as many more Americans are disabled by injury each year, with brain injuries and paralysis being the most debilitating. Since those who die of injury are mostly young, trauma accounts for more years of lost productivity before age 65 than heart disease, cancer and stroke combined.

Injury is America's most costly health issue and accounts for about \$300 billion in annual economic costs. This includes the direct costs of medical care coupled with the loss of earnings due to disability and premature death. The cost in human terms, particularly for young victims and their families, is enormous and cannot be quantified.

Inova Regional Trauma Center plays a central role in reducing the burden of injury on the region by saving lives and returning those who are seriously injured back to productivity. The alternative is a step back in time when unnecessary deaths among the seriously injured were common and disabilities were exacerbated due to delayed and inappropriate treatment.

### Inova Regional Trauma Center: THEN & NOW

#### Leading causes of injury for adults

1997:	Motor vehicle crashes (44.1%)
2006:	Motor vehicle crashes (57%)

#### Leading causes of injury for adults

1997: Fall (40.4%)

2006: Motor vehicle crashes (32%)

#### Number of Operating Rooms

1985:	4
1991:	22
2006:	52



## EDUCATION & OUTREACH

## What are TRAUMA CODES?

The center responds to each patient based on the severity of the injury.

#### Code Blue

Patients are severely injured with unstable vital signs. EMS personnel notify IRTC trauma responders via pager and a Code Blue team assembles immediately to receive the patient. The team includes a trauma surgeon, emergency medicine physician, senior surgical resident, trauma nurses and other care providers.

#### Code Yellow

Patients are seriously injured but have stable vital signs. Team composition and response are modified slightly for these patients.

#### Trauma Codes: THEN & NOW

Trauma Codes	1991	2006
Yellow	605	2,119
Blue	213	500

#### Rebuild

Rebuild is a support program that provides unique services and support to help people restore their daily lives after suffering traumatic injuries. The program solicits trauma survivors who volunteer to speak before medical professionals, rescue first responders, and others, providing first-person perspectives on how caregivers impact patients' recovery from trauma. Rebuild also offers new patients support and mentoring, both in group and one-on-one relationships. The program has provided support to the community of trauma survivors and caregivers since 1995.

2006 HIGHLIGHTS INCLUDE:

- A new support group, Rebuild Traumatic Brain Injury Families, was initiated June 2006 for family members of people living with TBI. It has been enthusiastically received by the TBI community.
- The 2006 Regional Award for Outstanding Contribution to EMS was presented to Rebuild by the Northern Virginia EMS Council.
- Rebuild members gave presentations to 17 classes with a total of 585 participants from among paramedics, medical students, nurses and other caregivers.
- Support group members provided mentoring and support to 166 hospitalized trauma patients.
- Work with the American Trauma Society continued in an effort to initiate support programs similar to Rebuild in trauma centers nationally.

#### Self Management

In the spring of 2006, Inova Regional Trauma Center (IRTC) piloted the Trauma Self Management Program, a nine-week course designed to teach trauma patients how to manage their own health and recovery. The course, developed by Johns Hopkins University (JHU) and the American Trauma Society, is modeled after successful self-management programs available to the amputee, arthritis and diabetes communities.

Self-management classes help patients build skills and learn problem-solving strategies. By helping patients in trauma recovery recognize the difference between what they can and cannot change, patients can focus on improving their communication skills, learning strategies to promote positive mood, staying healthy, and returning to work or school.

Based on feedback offered from pilot participants, JHU modified the program and began educating trauma centers nationally about self-management, anticipating training several centers in 2007 to offer the course. IRTC plans to offer the course at least yearly.

Anna Bradford, LCSW, Program Coordinator | Daniel Stanto, LCSW, Assistant Program Coordinator

### CIREN

The Crash Injury Research and Engineering Network (CIREN) is an eight-center research program that brings together clinicians and engineers in academia, industry and government to collect and examine data on patient injuries after motor vehicle crashes.

After exhaustive study of the crash site and wrecked vehicles, personal interviews are conducted with drivers and passengers.

In monthly reviews, physicians and engineers compare data to identify the source of each human injury. In sum, their findings point to motor vehicle design features that could be improved to better protect the occupants and improve the diagnosis, treatment and rehabilitation of those involved in a motor vehicle, pedestrian or motor cycle crash.

In 1999, Ford Motor Company awarded a \$1 million grant to Inova Regional Trauma Center (IRTC) to establish a CIREN center in Northern Virginia. In September 2002, the IRTC entered into an agreement with Honda R&D Co., Ltd to continue the CIREN project for two more years.

Inova Fairfax Hospital's CIREN Center is the only one in the nation that studies motor vehicle-pedestrian crashes. Since 1999, the center has enrolled 200 severe motor vehicle and 60 pedestrian crashes.

To improve the safety of the motor vehicle occupant, the center at Inova conducts research focused on injuries sustained by knee contact with knee bolsters in frontal crashes. This research has been presented at several local, national and international conferences and described in a current article to be published in professional engineering journals.

The experience and methodology of pedestrian crashes has been presented at local and national conferences; an article was accepted for publication by the Journal of Emergency Nursing for the June 2007 edition.

The Inova CIREN Center's pedestrian research has focused on the wrap distance of the pedestrian and associated head injuries. This research was accepted in the proceedings of the 2007 Enhanced Safety of Vehicle (ESV) conference.

Christine Burke, CIREN Coordinator | Gregory Stadter, Crash Reconstructionist

### Education and Outreach: THEN & NOW

1985:	Trauma	Symposium
	Trauma	Conference

1991: Trauma Symposium Trauma Conference Externship Program EMS Night EMS Review Trauma Caregivers Luncheons Surgical Critical Care Forum

2006: Trauma Symposium Trauma Conference Externship Program EMS Night EMS Review Trauma Caregivers Luncheons Surgical Critical Care Forum Advanced Trauma Life Support Trauma Nurses Core Courses Rebuild Program Reality Check Trauma Coalition Substance/Alcohol Focused Education (SAFE)



## **RESEARCH & PUBLICATIONS**



Research is an integral part of our mission. A well-developed research program is also a requirement for verification as a Level 1 trauma center. Our approach has been to engage in research driven by the needs of our population, striving for knowledge that can be translated into genuine clinical solutions for our patients. In addition, we sometimes engage in large multi-center trials at a national level, and as a result have gained recognition for our facility as a productive source of research.

#### ARTICLES

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4. Hendershot, K.; Robinson, L.; Roland, J.; Vaziri, K.; Rizzo, A.; and Fakhry, S.: "Estimated Height, Weight, and Body Mass Index: Implications for Research and Patient Safety." Journal of the American College of Surgeons 2006; 203(6):887-93.

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6. Aidinian, G.; Karnaze, M.; Russo, E. and Mukherjee, D.: "Trauma Endograph Repair of Traumatic Aortic Transection in a 10-Year-Old." Vascular and Endovascular Surgery, 2006; 40: 239-42.

7. Schwartzbach, C.; Seoudi, H.; Ross, A.E.; Hendershot, K.; Robinson, L.; Malekzadeh, A.: "Trauma Fracture of the Scapula with Intrathoracic Penetration in a Skeletally Mature Patient: A Case Report." Journal of Bone and Joint Surgery in America, 2006; 88:2735-8.

8. Waller, M.; Fakhry, S.: "Hemorrhagic Shock and the Use of Blood Substitutes." Perioperative Nursing Clinics 2006; 1:135-48.

9. Michetti, C.P.; Hanna, R., Moore, A.; Crandall, J.; Fakhry, S: "Contemporary Analysis of Thoracic Aortic Injury: Importance of Screening Based on Crash Characteristics." J Trauma 2006; 61:519. J Trauma 2006; 61:519.

## BOOKS, JOURNAL SUPPLEMENTS AND BOOK CHAPTERS

1. Court, Oliver: "Compartment Syndromes of the Extremities." Irwin, Richard S.; Rippe, James M., Eds. Manual of Intensive Care Medicine, 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2006. pp. 719-21.

2. Dwyer, K.; Reines, H.D.; Fakhry, S.M.: "Postoperative Critical Care for Neurosurgery." Sekhar, L.N., and ? F. R.: Atlas of Neurosurgical Techniques: Brain. New York: Thiems; 2006. pp. 72-92.

3. Dwyer, Kevin; Irwin, Richard S.; Rippe, James M., Eds. "Manual of Intensive Care Medicine." 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2006. pp. 677-83.

4. Dwyer, Kevin; Trask, Arthur. "Trauma, An Overview." Irwin, Richard S.; Rippe, James M., Eds., 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2006. pp. 690-2.

5. Fata, Paola, and Fakhry, Samir M.: "Multiple Organ Dysfunction Syndrome." Irwin, Richard S.; Rippe, James M.: Manual of Intensive Care Medicine, 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2006. pp. 727-30

6. Michetti, Christopher: "Hemorrhage and Resuscitation." Irwin, Richard S.; Rippe, James M.: Manual of Intensive Care Medicine. 4th ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2006. pp. 684-9.

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### Research Abstracts to National and International Meetings

1. Bowyer, M.W.; Rawn. L.; Hanson, J.; Pimentel, E.A.; Flanagan. A.; Rizzo. A.; Ritter, E.M. "Teaching Medical Students How to Break Bad News: A Novel Mixed Reality Simulation-based Curriculum" [Poster Presentation]: Sixty-fifth Meeting of the American Association for the Surgery or Trauma. New Orleans, LA. 2006

2. Fakhry, S.M.; Hendershot, K.M.; Robinson, L.; Rizzo, A.: "Costs of Care in Severe Traumatic Brain Injury and the Incremental Impact of Infections" [Poster Presentation]: Sixty-fifth Meeting of the American Association for the Surgery or Trauma, New Orleans, LA. 2006.

3. Fakhry, S.M.; Robinson, L.; Peitzman, A.B.; Esposito, T.: "An Update on Trauma Surgeon Compensation: A Survey of AAST and EAST" [Poster Presentation]: Sixty-fifth Meeting of the American Association for the Surgery or Trauma; New Orleans, Louisiana. 2006

4. Hanna, R.; Fakhry, S.M.; Rudd, R.; Rizzo, A.; Burke, C.; Bean, J.; Stadter, G.; Sherwood, C.. "Non-Ankle Lower Extremity Fracture [NALEF] in Frontal Crash: Bio-Mechanical Interactions of Driver Height, Vehicle Type, Seatbelt Use and Crash Delta-V" [Oral presentation]: 5th World Congress of Biomechanics, Munich, Germany. 2006.

5. Hendershot, K.; Fakhry, S.M.; Robinson, L; Reines, H.D.: "Trauma Documentation, Coding and Billing for Residents: An Educational Curriculum" Association of Program Directors in Surgery. Tucson, AZ. 2006.

6. Hendershot, K.M.; Fakhry, S.M.; Hakiman, H.; Robinson, L.; Hanna, R.; Rizzo, A.; Vaziri, K.; Dwyer, K.: "Duration and Safety of Computed Tomography in Severely-Injured Blunt Trauma Patients" [Poster Presentation]. Sixty-fifth Meeting of the American Association for the Surgery or Trauma. New Orleans, LA. 2006.

7. Longhitano, D.L.; Kadotani,Y.; Hitchcock, R.; Takahashi, Y.; Kinoshita, Y.; Fakhry, S.M.; Watts, D.D.; Burke, C.; Bean, J.; Crandall, J., et al: "Trauma" Application of the CIREN Methodology to the Study of Pedestrian Crash Injuries." The 19th International Technical Conference on the Enhanced Safety of Vehicles; Washington, D.C.

#### Inova Regional Trauma Center: THEN & NOW

#### Trauma Patients Entered in Registry

1,859	1991:
2,577	1997:
4,020	2006:

#### Research

1985: None

1997: 6 publications 7 presentations

2006: 9 articles 8 books, journal supplements, and chapters in books 7 presentations

## TRAUMA STATISTICS





#### All Trauma Patients 1994-2006

In 2006, we entered the names of 4,020 trauma patients into the trauma registry. This is a 5% increase over last year.



#### All Trauma Codes 1994-2006

Code blue patients are unstable with life-threatening injuries. Code yellow patients are stable with potential for life-threatening injuries.



ISS Mean for Admitted Trauma Codes 1995-2006



#### Leading Causes of Injury for Adults 2006

The leading cause of injury for adults continues to be motor vehicle crashes. Falls are the next leading cause of injury, but encompass only 19% of adult patients seen at Inova Regional Trauma Center.



#### Geographic Site of Trauma 2006

Of the Inova Regional Trauma Center's patients, 39% were injured outside of Fairfax County. This is an 1% increase over last year.

#### Fairfax County 61%



#### Leading Causes of Injury for Children 2006

In 2006, the leading cause of injury for children was motor vehicle crashes with a decrease in the number of patients aged 0-14 seen as a result of an MVC from last year.





## THE PEOPLE BEHIND THE MEDICINE

All Inova Regional Trauma Center physician specialists are board-certified or board-eligible in their specialty. In addition, each medical department and section, in collaboration with the chief of trauma services, has established continuing medical education requirements for participation in the trauma program. The emergency department, the trauma/medical/surgical ICU and the pediatric intensive care unit all have standard criteria for nurses and trauma responders. Nurses who care for trauma patients have mandatory competencies specific to the trauma population and receive ongoing continuing education in trauma care.

## TRAUMA SERVICES STAFF

1991: 1 trauma registrar 1 clinical nurse specialist 1 director 1 chief

THEN & NOW

**Trauma Staffing:** 

2006: 6 trauma surgeons with two additional positions open **3** clinical nurse specialists **4 nurse practitioners** 3 administrative support staff 2 trauma coders 2 trauma registrars 2 research managers 3 program coordinators for injury prevention and outreach 1 quality leadership manager (PI) 1 director 1 chief



Elaine Allen, RHIT Data Specialist, Registry

Joy Cowgill Administrative Coordinator

Mary Duggan, MSN, RN, NP Nurse Practitioner

Jeannie Fauntleory Administrative Coordinator

Cindy Hearrell, RN, BA, CEN Quality Leadership Manager

Deena Hollingsworth, MSN, RN, NP Nurse Practitioner

Pat Jones Department Secretary

Christine Linder, MSN, RN **Clinical Practice Specialist** 

Janet Mercer, MSN, RN **Clinical Practice Specialist** 

Rebekah Miller, CPC, CCP Trauma Coder

Sheila Prince, CPC Trauma Coder

Cita Read, MSN, RN, NP Nurse Practitioner

### TRAUMA SURGEONS

Robert F. Ahmed, MD, FACS	Christopher Michetti, M.D., FACS	Hani Seoudi, M.D., FACS
Richard Brenner, MD, FACS	John J. Moynihan, M.D., FACS	Arthur Trask, M.D., FACS
Kevin Dwyer, MD, FACS	H. David Reines, M.D., FACS	Barry Walter, M.D., FACS
Kirsten E. Edmiston, MD, FACS	Anne Rizzo, M.D., FACS	
Samir M. Fakhry, M.D, FACS	Eugene Russo, M.D., FACS	

Linda Robinson, MA, MSN, RN Trauma Research Manager

Jessica Speir, MSN, RN, NP Nurse Practitioner

Alex Solorzano Data Specialist, Registry

Maureen Waller, MSN, RN Director, Trauma Services

### TRAUMA COMMITTEE MEMBERS

Marjorie Avery, MSN, RN Patient Care Director, Trauma Neuro ICU

Colleen Beres, BSN, RN Patient Care Director, Intermediate Care

Robert Cates, MD Chairman, Emergency Department

Joan Cook, RN Tower OR

Keith Dockery, MD Pediatric Intensivists

Glenn Druckenbrod, MD Medical Director, Emergency Department

Mary Duggan, MSN, RN, NP Trauma Services

Kevin Dwyer, MD Associate Chief, Trauma Services

Samir Fakhry, MD Chief, Trauma Services

Steve Lussos, MD Anesthesiology

Joan Grand, MSN, RN Management Coordinator, Emergency Department

Danny Gray, Battalion Chief, Fairfax County Fire and Rescue

Gail Green PICU

Dan Hanfling, MD Medical Director, PHI AirCare

Cindy Hearrell, RN, BA, CEN Trauma Services

Deena Hollingsworth, MSN, RN, NP Trauma Services Robert Hymes, MD Department of Orthopedics

Sean Jebraili, MD Neurosurgery

Daniel LaBriola, MD Oral Surgery

Jae Lim, MD Neurosurgery

Christine Linder, MSN, RN Trauma Services

Kenneth May, Lieutenant Fairfax County Police Helicopter Unit

Janet Mercer, MSN, RN Trauma Services

Karen Meller, RN PICU

Christopher Michetti, MD Trauma Surgery

Tom Mulligan, MSW Social Work

Ben Nguyen, MD Neurosurgery

Hong Nguyen, PharmD Pharmacy

Michael Norton, RN Director, PHI Aircare

Patrick Oliverio, MD Radiology

Cita Read, MSN, RN, NP Trauma Services

Anne Rizzo, MD Trauma Surgery Linda Robinson, MA, MSN, RN Trauma Research Manager

Eugene Russo, MD Chair, Trauma Committee

Joanne Scrapper, RN Tower OR

Cary Schwartzbach, MD Orthopedics

Parul Shah Respiratory Services

Hani Seoudi, MD Trauma Surgery

Wan Shin, MD Medical Director, Physical Medicine and Rehabilitation

Faisal Siddiqui, MD Ortho Spine

Jessica Speir, MSN, RN, NP Trauma Services

Rose Szeles, BSN, RN Patient Care Director PICU

Dawn Thornton, MD Emergency Department

Paul Tripathi, MD Emergency Department

Maureen Waller, MSN, RN Director, Trauma Services

Joseph Watson, MD Neurosurgery

Christine Woodard, Captain Fairfax County Fire and Rescue





## A CONTINUUM OF CARE

Trauma is the most serious and most preventable of all health problems. It is also the third leading cause of death in the United States.

Inova Regional Trauma Center and Inova Health System are proud to be leaders in efforts to prevent trauma and injury and enhance the quality of life and health in our community. We work to help ensure that each trauma patient receives consistently high quality, coordinated care from the prehospital phase through hospitalization, rehabilitation and recovery.

#### To reach the Inova Regional Trauma Center, call 703-776-2274.





Inova Fairfax Hospital 3300 Gallows Road Falls Church, Va 22042

Inova Health System is a not-for-profit health care system based in Northern Virginia that consists of hospitals and other health services including emergency and urgent care centers, home care, nursing homes, mental health and blood donor services, and wellness classes. Governed by a voluntary board of community members, Inova's mission is to improve the health of the diverse community we serve through excellence in patient care, education and research.

www.inova.org

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