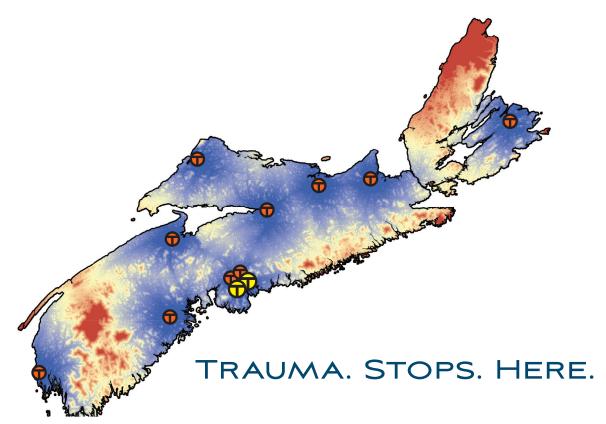
NOVA SCOTIA TRAUMA PROGRAM





WELCOME TO

NOVA SCOTIA TRAUMA PROGRAM



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@TraumaNSMedical @EducateTNS @ResearchTNS

NOVA SCOTIA TRAUMA PROGRAM

MANAGER'S MESSAGE



SUSAN HARNISH, BCom

Welcome to the 2015 Nova Scotia Trauma Program (NSTP) Annual Report. This is the thirteenth report of its kind and contains information regarding the accomplishments of the NSTP, trends of major traumas in Nova Scotia using data from the NSTP Registry, education and research updates, as well as future plans and initiatives.

This year, Dr. Natalie Yanchar stepped down as the IWK Trauma Medical Director after dedicating 15 years to the role. We at the NSTP would like to express our gratitude and appreciation to Dr. Yanchar for her time and contribution to the NSTP. Thank you so much, Dr. Yanchar!

We would like to welcome Dr. Dafydd Davies as the new IWK Trauma Medical Director. Dr. Davies received his medical degree from Dalhousie Medical School and performed his residency training in the Division of General Surgery at Dalhousie, during which time he also completed a Fellowship in Pediatric Trauma at the Hospital for Sick Children in Toronto and a Masters in Epidemiology at Cambridge University in England. We are very excited to have Dr. Davies join us and look forward to working with him to improve trauma care in Nova Scotia.

The data provided in this report have been made available to the NSTP through the participation and cooperation of

Nova Scotia's Regional and Tertiary Trauma Centres, the Nova Scotia Medical Examiner Service, Department of Health and Wellness' Business Intelligence and Analytics, and Emergency Health Services sections, as well as those individuals who assist in data collection at regional trauma centres. We thank them for their continued participation and assistance. As well, we would like to thank all those individuals who work each day to care for the province's trauma patients and who are instrumental in the initial collection of data from patient care records.

This report would not be possible without the hard work of many individuals. Deserving special mention are the Nova Scotia Trauma Program staff: Beth Sealy, Trauma Registry Coordinator; Kathy Hartlen, Education Coordinator; Virginia Manuel, Informatics Paramedic; Darlene Cathcart, Informatics Nurse; Mete Erdogan, Research Associate; and Linda Warden, Administrative Assistant.

We continue to strive to improve the care of major trauma patients through education, research, and support of injury prevention initiatives, and we would like to share some of the progress of the NSTP with you in this report. We hope you find the report informative and thought provoking.

X Xant

PROVINCIAL TRAUMA

MEDICAL DIRECTOR'S MESSAGE



ROBERT GREEN, BSc, MD, DABEM, FRCPC, FRCP (Edin)

It is our pleasure to present the 2015 NSTP Annual Report. Significant progress has occurred in the management of injured Nova Scotians: there has been a trend towards improved survival from traumatic injury over the past five years in the province. Furthermore, patients across the province have rapid access to expert care, with almost 90% of injuries being managed in a regional trauma center within one hour of paramedic arrival.

However, despite the best efforts of our trauma care and injury prevention professionals, traumatic injury rates in Nova Scotia are steadily increasing. More concerning is the fact that we are seeing a growing number of major trauma cases provincially. It is also important to note that the majority of trauma deaths occur at the scene of injury, and that mortality rates differ depending on the geographic location where the injury occurred.

This report provides a glimpse into some of the challenges facing our trauma system in Nova Scotia. Impaired driving is a leading cause of traumatic injury and is still far too common in our population. Using trauma data collected by the NSTP, we are actively working together with clinicians, policy makers and community members across the province to better understand the impact of trauma in Nova Scotia and to develop strategies for optimizing patient outcomes and the performance of the trauma system.

Moving forward, we see many opportunities for reducing the burden of traumatic injury in Nova Scotia. One priority is the provision of expert trauma education. With our Rural Trauma Team Development Course, NSTP staff travel to communities throughout the province to provide a one-day course consisting of hands-on demonstrations and simulated patient scenarios. These courses have been a resounding success: health care providers are effectively translating training and knowledge they acquire through the course into their daily practice.

We welcome enquiries and dialogue regarding our program and trauma injuries in Nova Scotia. Trauma is an underappreciated burden in our society and health care system, and few realize that trauma is the number one cause of mortality in Nova Scotians less than 44 years of age and significantly impacts the lives of those who survive their injuries. Therefore, trauma prevention is paramount. For those individuals who suffer a serious injury, receiving optimal trauma care in a timely manner is something that makes a world of difference for them, their families and their loved ones. We at the NSTP are proud to lead the way.



NSHA, CENTRAL ZONE TRAUMA MEDICAL DIRECTOR'S MESSAGE



IWK TRAUMA MEDICAL DIRECTOR'S MESSAGE



SAM MINOR, MD, FRCSC, FACS

The QEII Trauma Program is responsible for the initial resuscitation, evaluation and triage of trauma patients arriving at the Halifax Infirmary Hospital. As the only adult level one trauma centre in Nova Scotia, we coordinate closely with the Provincial Program and are the last stop point for all severely injured patients. Our multidisciplinary Trauma Team consists of nurses, residents and physicians from general surgery, emergency medicine, orthopedic surgery, anesthesia, neurosurgery, and diagnostic imaging. Our goal is to provide the highest quality of care to the traumatized patients of Atlantic Canada.

We have had an exciting year of quality improvement with implementation of a new safety reporting system. This has been incorporated into a simulation program that can evaluate possible solutions for any potential issues. We have increased our educational endeavors at the QEII with integration of trauma training into a surgical boot camp that now ensures that every resident participating on the trauma team has Advanced Trauma Life Support training. We have implemented a new process for resident Trauma Team Leader evaluation that will allow us to communicate resident performance to the individual resident programs.

We have also made strides towards the development of an inpatient trauma service that will provide a continuum of care from the trauma bay to the hospital ward. A consolidated inpatient service will allow for the specialization of multidisciplinary services, improve communication between consulting services and referring physicians, and improve compliance with quality initiatives such as the tertiary survey.

The QEII Trauma Program has made significant advances in the past year but much work lies ahead of us. With the commitment and talent of our multidisciplinary team, it is an exciting time to be part of such a vibrant program!

Sam L

DAFYDD A. DAVIES, MD, MPhil, FRCSC

The IWK Health Centre remains the only tertiary care centre for children and adolescents in the Maritime Provinces. The IWK Trauma Program is committed to the care of these patients when injuries are suffered. Sadly, traumatic injuries remain the number one cause of morbidity and mortality in this age group. Through our ongoing relationship with the Nova Scotia Trauma Program, we are making great stides towards achieving our goal of reducing the impact of these injuries.

Relative to adult patients, the number of serious injuries in children are low. This makes it challenging to maintain a system capable of providing the highest level of care. In order to improve the care of injured children and adolescents, we have expanded our activities into the areas of education, quality assurance and oversight initiatives.

The data collected and managed by the Nova Scotia Trauma Program is integral to the success of our program. We utilize it on an ongoing basis to guide injury prevention initiatives, resource allocation and outreach to community/rural health professionals who are often the first line of care for injured children. Our partnership allows us to reach out to those communities and to provide them with support in managing injured children and keeping their teams up to date in pediatric trauma care.

As the Medical Director of the IWK Trauma Program, I would like to thank the Nova Scotia Trauma Program for their hard work and continued support of pediatric trauma care in this province. We look forward to continuing and expanding our partnership in the years to come.

OUR GOAL IS TO PROVIDE THE HIGHEST QUALITY OF CARE TO THE TRAUMATIZED PATIENTS OF ATLANTIC CANADA.

MISSION

The Nova Scotia Trauma Program facilitates the provision of optimal trauma care through leadership in patient care, education, research, injury prevention and the continuous development and improvement of our trauma system.

HISTORY OF THE NSTP

In 1997, a Provincial Trauma Program Development Team was established by Emergency Health Services (EHS), a division of the Nova Scotia Department of Health, to provide advice for the establishment of a Provincial Trauma Program. This group, comprising trauma stakeholders (consumers, care providers, and administrators), identified a number of key strategies and areas of focus for trauma program development. Based on these recommendations, EHS launched the Nova Scotia Trauma Program in 1997. The Trauma Program is located within the Nova Scotia Health Authority (NSHA), Central Zone under the strategic direction of the Nova Scotia Department of Health and Wellness, Emergency Health Services.



Linda Warden, CAP-OM Administrative Assistant



TRAUMA REGISTRY

The Nova Scotia Trauma Registry (NSTR) is an invaluable resource enabling the Nova Scotia Trauma Program and others to conduct quality assurance, engage in injury surveillance, perform research and develop injury prevention and control strategies. In addition, trauma registries allow administrators and clinicians alike to engage in evidence-based decision making, policy development and program planning.

Our database is the only population-based trauma registry in Canada, capturing data on major traumas from hospitals across the entire province. The information is collected from the QEII Health Sciences Centre, the IWK Health Centre, the eight regional hospitals and the Nova Scotia Medical Examiner Service.

The registry has been province-wide since April 2000 and now houses over 13,000 records of the most severely injured patients, with the capacity to collect over 2200 data elements per record.

The NSTP received over 30 requests for information from the NSTR in 2015, including several projects which have involved linkages with other databases to create more robust data. This year the NSTP, with the other provincial programs, participated in the development of the First Nations Client Linkage Registry, to produce health indicators for this unique population.



DATA FROM THE NSTR HAS BEEN UTILIZED FOR AWARD WINNING RESEARCH, PUBLICATIONS, PRESENTATIONS AT NATIONAL AND INTERNATIONAL CONFERENCES, PUBLIC POLICY ADVOCACY, PROGRAM PERFORMANCE INDICATORS AND EVALUATION.



Data from the NSTR has been utilized for award winning research, publications, presentations at national and international conferences, public policy advocacy, program performance indicators and evaluation. Masters and PhD candidates have also used the data in their thesis projects.

Information can be made available to clinicians, researchers, and to injury prevention organizations and programs by completing a data request form and complying with the associated privacy and release of information policies.

NSTR information request forms may be obtained by contacting us via email: nstrauma@nshealth.ca



Beth Sealy, BA, CHIM Coordinator, NS Trauma Registry



Virginia Manuel, CHIM, ICP Informatics Paramedic

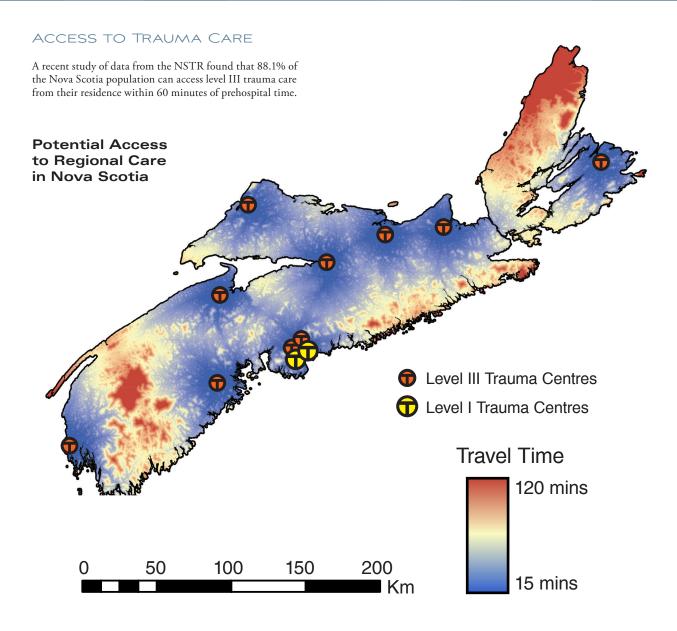


Darlene Cathcart, RN Informatics Nurse



Kathy Hartlen, RN Education Coordinator

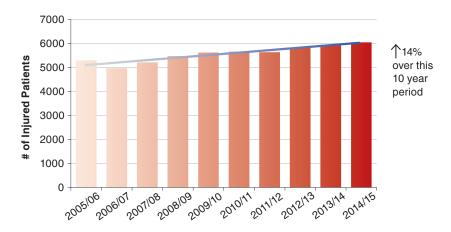
88.1% OF NOVA SCOTIANS HAVE ACCESS TO REGIONAL TRAUMA CARE WITHIN ONE HOUR OF PREHOSPITAL TIME



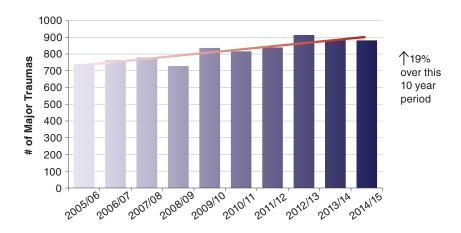
INCREASING BURDEN OF INJURY

The burden of injury has been steadily increasing in Nova Scotia. There has been a 14% increase in all injuries admitted to hospital over the past decade, with a 19% increase in major trauma cases over this time period.

All Patients Admitted to Hospital in Nova Scotia For Any Injury



Major Trauma Cases Only

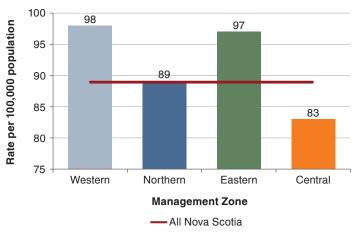


OVER THE PAST DECADE,
MAJOR TRAUMA IN NOVA SCOTIA
HAS INCREASED BY 19%

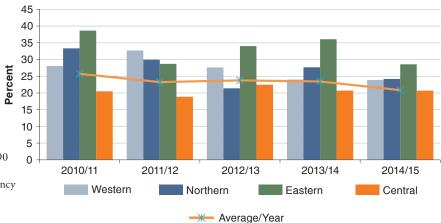
MAJOR TRAUMA RATES PER CAPITA VARY BY NSHA ZONE



Major Trauma Rates per 100,000 Population 2014/15



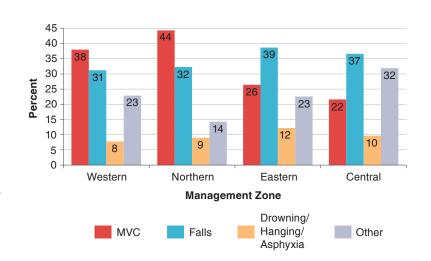
Mortality of Major Trauma by Zone of Injury Location



Note: Abbreviated Injury Scale, 1990 Version. All death types included: deaths on scene, enroute, in emergency department, and in-hospital

Most Common Mechanisms of Injury per Zone 2014-15

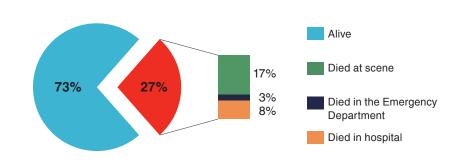
Note: "Other" includes pedestrians, guns, assaults, stabbing, burns, bicycles, other blunt traumas, other penetrating traumas, and unknown.



DESPITE HIGH VARIABILITY
ACROSS NOVA SCOTIA, OVERALL
MORTALITY HAS DECREASED
OVER THE PAST 5 YEARS

MORTALITY FROM MOTOR VEHICLE COLLISIONS HAS DECREASED; HOWEVER, FALLS ARE INCREASING

Major Trauma Outcomes 2014-15



Major Trauma Deaths by Mechanism 45

40

35 30 28 25 26 23 20 19 21 22 21 15 17 10 5 0 2010/11 2011/12 2012/13 2013/14 2014/15

Falls

MVC

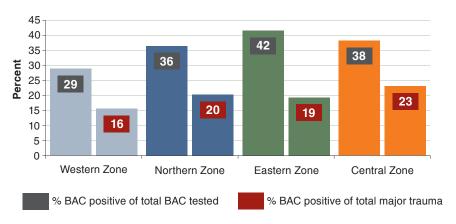
Guns

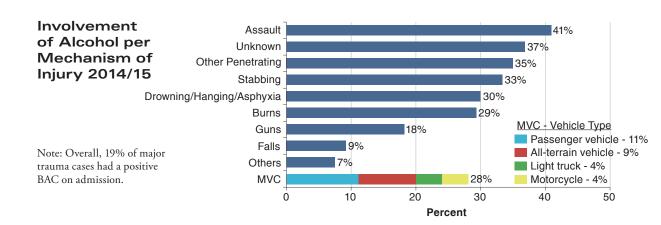
Other

Note: Abbreviated Injury Scale, 1990 Version

ALCOHOL USE AND TRAUMATIC INJURY

Major Trauma and Blood Alcohol Concentration (BAC) 2014/15







BASED ON THE SUCCESS OF TRIAL IN SITU SIMULATIONS IN 2015, FUTURE HOSPITAL-WIDE SIMULATIONS ARE PLANNED

EDUCATION

The Nova Scotia Trauma Program delivers trauma education opportunities to Inter-Professional health care providers across the province. The goal of these programs is to increase trauma knowledge and skills. These programs provide a communication network within the province to improve the trauma system and address best practices in trauma care.

This year, we have introduced In Situ Simulations at the QEII HSC. Our programs continue to be CME approved through the Dalhousie University CME office. Communications are delivered via Twitter (@EducateTNS), and we are working to improve the design and functionality of our website. This year, the following educational opportunities were coordinated:

Advanced Trauma Life Support (ATLS)

This course teaches clinicians how to assess a patient's condition, resuscitate, stabilize, determine and arrange inter-facility transfers in our trauma system. In 2015, a total of six courses were held with approximately 105 physicians receiving ATLS certification. Paramedics, nurses and respiratory therapists from LifeFlight and the QEII Trauma Team continue to attend.

ATLS Instructors Course

This course builds our future ATLS instructors. Under the guidance of an educator, course participants acquire an understanding of educational principles and how to properly facilitate an ATLS course.

We are pleased to have gone through a successful application process with the American College of Surgeons to allow us a local educator, Dr. Constance LeBlanc, FCFP, CCFP (EM), MAEd, who can lead these courses. A course will be offered in June 2016.

Trauma Education Webinars

We have improved the delivery of online trauma education through the use of webinars. This method is more adaptable to the busy schedules and geographic locations of health care workers. Over the past year, seven webinar sessions were attended by 169 learners.

Rural Trauma Team Development Course (RTTDC)

This course is offered in a one-day format and emphasizes a team approach to the initial evaluation and resuscitation of the trauma patient at a rural facility. "Hands on" practical skills stations for key trauma skills are an important part of the course. We have increased the number of courses offered and adapted the learning methods to meet the needs of participants. Partnering with the EHS Simulation Vehicle and its high fidelity simulator creates more realism in the trauma scenarios. In 2015, courses were held in Amherst, Springhill, Strait Richmond, Kentville, Inverness, Neil's Harbor, Colchester and Twin Oaks, and provided trauma education to 135 inter-professional learners.

Inter-Professional Clinical Trauma Rounds

The Inter-Professional Clinical Trauma Rounds have become more interactive with the inclusion of simulation, live voting and polls! On a provincial scale, learners can log into the webinar and be part of the action. Five sessions were held in 2015 with over 300 participants.

In Situ Simulations

In Situ Simulations are trauma scenarios that encompass the full extent of the Trauma Team and the Trauma System. Scenarios are conducted as a "real" trauma and are designed to develop critical clinical and crisis resource management skills. The design of this session allows for the ability to assess ALL aspects of a trauma. Debriefs occur in real time and future scenarios can be based on latent safety issues from previous sessions.

Kathy Hartlen, RN
Education
Coordinator





Pediatric Education

Trauma Education Orientation for nursing staff in the IWK Emergency Department (ED) occurred again this year during a day-long session which included both lecture style and simulation training.

This year, we also introduced an orientation to the "Trauma Team Activation" process for ED Ward Clerks, a group who are essential to the smooth progression of a trauma patient's time in the ED.

Multidisciplinary Trauma Rounds continue to be scheduled 5-6 times per year. The presentations this year included "Pediatric Femur Fractures", "Pediatric Trauma in a Resource Stressed Region" and "Alcohol Screening and Intervention in a Pediatric Trauma Centre". Presenters included Trauma Team Leaders and the Pediatric Trauma Coordinator.

The Pediatric Trauma Medical Director and the Pediatric Trauma Coordinator helped faciliate and teach three of the Rural Trauma Team Development Courses held this year.

Trauma Team Leaders participated in multiple Trauma Simulation Sessions this year. These multidisciplinary sessions included ED nurses, Respiratory Therapists, and Pediatric Emergency Fellows. Sessions highlighted important clinical and communication skills, as well as crisis resource management during a Trauma Team Activation. ED Management has identified a dedicated ED nurse to assist with providing realistic scenarios reflecting the critical skills needed to manage severely injured children at the IWK.

Janet Lake, RN, BN Trauma Coordinator, IWK Trauma Care Program



AN ORIENTATION TO TRAUMA TEAM ACTIVATION FOR ED WARD CLERKS WAS INTRODUCED THIS YEAR

RESEARCH

Traumatic injury is a major, largely unrecognized public health problem in Nova Scotia. Trauma is the leading cause of death in the population between the ages of 1 and 44, and the effect of trauma on productive life years lost exceeds that of any other disease. The purpose of trauma research is to translate evidence into practice and inform actions that will significantly improve survival and function, thereby improving public health and decreasing the associated costs.

NSTP Research Activities

The NSTP actively conducts research on a broad range of topics related to the prevalence of traumatic injuries, trauma care, and trauma system performance. In 2015, the NSTP published 5 studies and presented over 20 abstracts at local, national, and international conferences. These studies included investigations of pediatric major trauma related to sport and recreational activities, procedural sedation and analgesia in trauma patients, trauma recidivism, and the impact of the age of stored blood on trauma mortality.

Alcohol and Traumatic Injury

Alcohol abuse is known to increase the risk of experiencing a traumatic event and is associated with poor health outcomes. Furthermore, intoxicated trauma patients are more likely to be admitted to hospital again for a future traumatic injury. One subgroup that poses significant risk to public health is the injured intoxicated driver. The NSTP is involved in ongoing research to assess the impact of alcohol on traumatic injury and trauma recidivism in the province. The results of these projects will determine the association between trauma and alcohol use. These findings will be used to inform policy makers when developing future provincial strategies on alcohol and trauma.

Collaboration and Mentorship

Mentoring and collaboration are key aspects of the NSTP research program. NSTP staff members continue to mentor Dalhousie University Medical Students through the Research In Medicine (RIM) Program, as well as other graduate students, residents and fellows, both locally and nationally.

A number of ongoing projects are being performed in partnership with clinicians and researchers from across Canada. The NSTP is also collaborating with numerous investigators (provincially and nationally) on important research initiatives that have been submitted to the Canadian Institutes of Health Research grant competition.

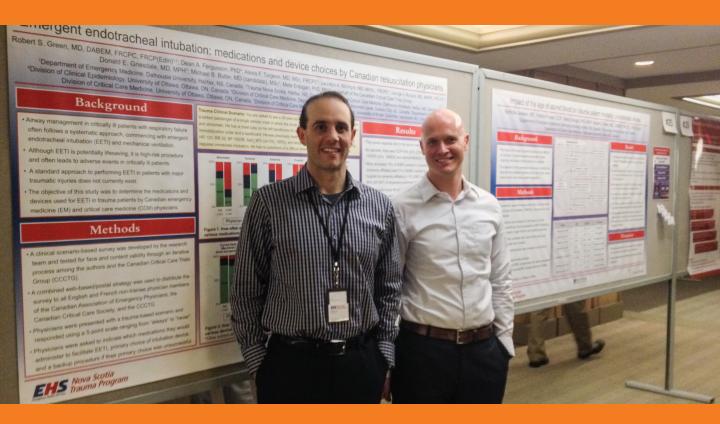
Importance of Trauma Research

Trauma affects individuals of all ages, social groups, and backgrounds, as well as their loved ones, caregivers, and dependents. Injuries occur every day from motor vehicle collisions, falls, assaults, and other causes. However, injuries are not accidents; 95% of injuries are predictable and preventable. The overall goals of NSTP research activities are to reduce the burden of major traumatic injury, to enhance the performance of the provincial trauma system, and to improve patient outcomes and the quality of trauma care.





OVERALL GOALS OF NSTP RESEARCH ARE TO REDUCE THE BURDEN OF MAJOR TRAUMA, TO ENHANCE TRAUMA SYSTEM PERFORMANCE, AND TO IMPROVE PATIENT OUTCOMES AND THE QUALITY OF TRAUMA CARE



RESEARCH

Published Manuscripts

- Impact of the age of stored blood on trauma patient mortality: a systematic review (Canadian Journal of Surgery)
- A retrospective evaluation of pediatric major trauma related to sport and recreational activities in Nova Scotia (Canadian Journal of Emergency Medicine)
- The prevalence of alcohol-related trauma recidivism: a systematic review (Injury)
- Adverse events and outcomes of procedural sedation and analgesia in major trauma patients (Journal of Emergencies, Trauma and Shock)
- Legal consequences for alcohol-impaired drivers injured in motor vehicle collisions: a systematic review (Accident Analysis & Prevention)

Manuscripts Under Review

 Use of intraosseous devices in trauma: a survey of trauma practitioners in Canada, Australia, and New Zealand

Manuscripts in Preparation for Submission

- Age of transfused blood in adult trauma patients: subgroup analysis of the ABLE trial
- A characterization of major adult sport-related trauma in Nova Scotia, 2000-2013

Trauma Research Studies in Progress

- An investigation of the health and economic outcomes of alcohol-related traumatic brain injury in Nova Scotia
- Transfusion strategies in traumatic brain injury
- Post-intubation hypotension in trauma patients
- Alcohol-related major trauma recidivism in Nova Scotia: a retrospective analysis
- Factors associated with adverse outcomes in adult trauma patients in Nova Scotia

Conferences Attended in 2015

NSTP members presented research at various local, national, and international conferences in 2015, including:

- Trauma Association of Canada Annual Scientific Meeting and Conference (April 10-11, Calgary AB)
- Canadian Association of Emergency Physicians Annual Conference (May 30-June 3, Edmonton AB)
- Atlantic Collaborative on Injury Prevention Annual Conference (June 8-9, Halifax NS)
- Emergency Medical Services Research Day (October 26, Halifax, NS)
- London Trauma Conference (December 8-11, London, England)

TRAUMA TEAM ACTIVATION

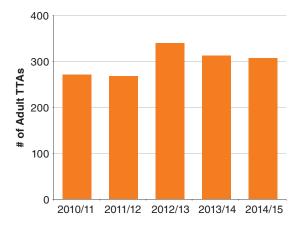
Nova Scotia has two Level 1 trauma referral centres, both of which are located in Halifax. The QEII Health Sciences Centre is the site of our multidisciplinary Adult Trauma Team. This trauma team manages adult patients (age > 17 years) from all over Nova Scotia, as well as seriously injured patients from Prince Edward Island and New Brunswick.

Our pediatric trauma population is supported by our Pediatric Trauma Team located in the IWK Health Centre. Children from all over the Maritimes can be referred to the Pediatric Trauma Team for advanced care.

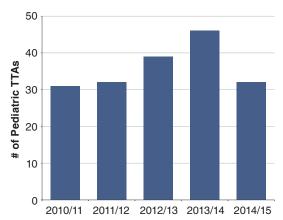
We strive for rapid referral in the triage of all major trauma patients in Nova Scotia. Our on-call trauma team leaders can provide immediate advice to clinicians who are managing injured patients anywhere in the Maritimes.

Our trauma system can be easily accessed by contacting one of our communication paramedics at 1-800-743-1334 on a 24 hour basis. Please note that both the Pediatric Trauma Team and the Adult Trauma Team can be contacted through the same number.

Adult Trauma Team Activations at the QEII Health Sciences Centre



Pediatric Trauma Team Activations at the IWK Health Centre



IN 2014/15, THE TRAUMA TEAM
WAS ACTIVATED IN 307 TRAUMAS
AT THE QEII HSC AND IN
32 TRAUMAS AT THE IWK

TRAUMA TEAM LEADERS







FUTURE PLANS AND EVENTS

Trauma-Related Conferences in 2016

- Trauma Association of Canada Annual Scientific Meeting and Conference 2016, Halifax, Nova Scotia, May 6-7. Five abstracts presented.
- Canadian Association of Emergency Physicians (CAEP) Conference 2016, Québec City, Québec, June 4-8. Four abstracts presented.
- London Trauma Conference, London, England. December 2016.

Research in Medicine (RIM) Students

The NSTP continues to support young trauma researchers through the RIM Program at Dalhousie University. In 2016, we will be working with one first year medical student as well as one returning second year medical student on a variety of trauma-related projects.

NSTP Newsletter

In 2016, the NSTP will begin circulating an electronic Trauma newsletter. Updates on current trauma events will be provided on a regular basis.

NSTP Website Re-Design

The NSTP website is in the process of being revamped and redesigned and will be launched in 2016. Stay tuned!

Canadian Resuscitation Outcomes Consortium

In collaboration with the Division of EMS, Department of Emergency Medicine at Dalhousie University, the NSTP is taking steps to make Nova Scotia a new site for the Canadian Resuscitation Outcomes Consortium (CanROC). The aim of this national resuscitation clinical research program is to collect prehospital and in-hospital data on patients with cardiac arrest or life-threatening traumatic injury and use it to perform research that leads to higher survival rates and better outcomes in these critically ill patients.

TRAUMA AFFECTS
INDIVIDUALS OF ALL
AGES, SOCIAL GROUPS
AND BACKGROUNDS, AS
WELL AS THEIR LOVED
ONES, CAREGIVERS,
AND DEPENDENTS

1-800-743-1334

