

Regional Trauma Program Annual Report

2006-2007



A Report on the activities of the Vancouver Coastal Health Regional Trauma Program for fiscal year April 1, 2006 to March 31, 2007.

Regional Trauma Program Annual Report 2006-07

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Executive Summary

This is the second Annual Report from the VCH Regional Trauma Program, and follows the Annual Report for 2005-06 released in late 2007. This report includes updates on injury epidemiology, Regional Trauma System activity and performance with thanks to QUIST, BC Children's Hospital, the BC Trauma Registry and the BC Coroner's office for their data support.

Program Priorities in 2006-07

1. The first priority has been the implementation of the Trauma Association of Canada (TAC) recommendations following the Regional Trauma System Accreditation in 2005. This is reported on in Section J, and, although the majority of this work has now been completed, two significant regional issues remain to be addressed before re-accreditation in 2010. These are
 - I.) Access to rehabilitation services for trauma patients, and
 - II.) An update of pre-hospital trauma triage & transport guidelines
2. The second major focus has been a review of the Regional Trauma System configuration and service alignment as part of the OANIC strategic redesign initiative. The primary goals of this initiative have been to ensure:
 - I.) Rapid trauma system access for patients,
 - II.) Best practices and optimal patient outcomes and
 - III.) Sustainable system with minimal service duplication.

This work has also been oriented to the new national trauma system guidelines from TAC as well as academic and other criteria. This work is detailed in Section K.

Regional Program Highlights

- OAN service redesign project: service level definitions and resource requirements (adult & pediatric), preliminary service realignment concept.
- Regional adult and pediatric LLTO "Trauma No Refusal" policy ratification.
- Autolaunch program expansion to BCAS Region 2 (VCH & FHA)
 - Adult trauma: VGH and RCH
 - Pediatric trauma: BCCH
- Improving system performance and patient outcomes

Overview of RTP Goals for 2006-07

- Following the successful completion and achievement of a 5-year regional Trauma accreditation this program will focus on implementing the recommendations garnered from this process.
- Framing the Accreditation recommendations within the strategic direction of the OAN, the program team will begin to align trauma service delivery among all facilities ensuring that the trauma patient is placed in the appropriate facilities with the appropriate service adjacencies and resources necessary to ensure best health outcomes.

- Continued collaboration in the Autolaunch Program working closely with BCAS, BCCH and FHA to monitor compliance, contribute to evaluation criteria, and monitor access indicators.
- Revision of selected Regional Trauma CPG's with development of process to identify compliance and adherence.
- In collaboration with BCAS, BCCH and FHA revise and refresh the existing BCAS Code 99 protocol to reflect the VCH RTP work on optimum configuration of Trauma services within VCH and align with new TAC accreditation guidelines in preparation for FHA accreditation in 2009 and VCH/BCCH re-accreditation in 2010.

Integration Initiatives in Collaboration with:

- Pediatric Council and BCCH to ensure that the pediatric trauma population is incorporated into all VCH capacity optimization work.
- BC-TAC and the VCH leadership team in supporting the formal development of a Provincial Trauma Coordinating Office.
- Other HA's to facilitate interregional consistency, support the foundational work of a Provincial Trauma Coordinating Office as well as partnering with each region to meet the Provincial performance agreement of Trauma accreditation for each region in the province by 2009.
- BC Injury Prevention Agencies (BCIPC, BCIRPU, BCIPLN) to more fully integrate injury prevention into a provincial injury control program.
- 2010 Olympics Planning Committee and Regional Emergency Preparedness to prepare, plan, and practice several mass casualty incidents prior to the 2010 games.
- Population Continuum for Persons with Disabilities to address Rehabilitation needs for the Trauma population within VCH.

Regional Trauma Working Group (RTWG)

This report is respectfully submitted on behalf of the RTWG, made up of the trauma co-leads from each of our designated trauma sites within VCH and the BC Children's Hospital. The RTWG has been active throughout the year on the major initiatives reported here. RTWG membership 2006-07:

- | | |
|-------------------------------|---|
| • VCH Regional Leads: | Ms. Catherine Jones, Dr. Richard Simons |
| • BC Children's Hospital | Ms. Lisa Widas, Dr. Ash Singhal |
| • Lions Gate Hospital: | Mr. Landon James, Dr. Alec Ritchie |
| • Richmond Hospital: | Dr. Robert Griffiths |
| • St. Paul's Hospital: | Ms. Sandra Bazley, Dr. Jock Reid |
| • Vancouver General Hospital: | Ms. Tracey Taulu, Dr. David Evans |

Regional Trauma Program

Regional Trauma System

Vancouver Coastal Health (VCH) is one of 4 geographical Health Authorities in BC that have developed independent regional trauma systems and services with a designated tertiary trauma centre serving the major-trauma needs of their population, supported by other hospitals in the system. In addition, Northern Health lacks critical tertiary trauma care services and is supported by the VCH Trauma System for tertiary care. The Provincial Health Service Authority (PHSA) has a dual role in supporting BC Children's Hospital as the Provincial Pediatric Trauma Centre as well as providing oversight and coordination of trauma services province-wide through the BC Trauma Advisory Committee (BC-TAC) and the Provincial Critical Services Steering Committee (PCSSC) both chaired by PHSA. Please see the 2005-06 Annual Report for further details.

Hospital Services

Vancouver General Hospital (VGH), and BC Children's Hospital (BCCH), are the designated tertiary trauma centres for the Regional Trauma System and are the adult/pediatric provincial trauma centres (Level 1). They have a central role in delivering trauma care in VCH and BC including:

- Tertiary trauma care for adult patients from VCH and NHA (VGH); for pediatric patients from the whole of BC (BCCH);
- Quaternary trauma services (e.g. burn, spinal cord, complex orthopedic, endovascular and complex hepatobiliary trauma care) for BC; and
- Trauma leadership through their clinical and academic programs.

The other large urban medical centres in VCH have a crucial role in providing a large volume of secondary trauma care and a supportive role in tertiary care. All of the smaller acute care facilities in VCH are involved in early resuscitation and stabilization of trauma patients.

Pre-hospital Care

Pre-hospital care is delivered throughout VCH and BC by the BC Ambulance Service (BCAS). Rapid identification and primary transport of major trauma patients to trauma centres has been a primary goal of the BCAS trauma protocols and has recently augmented by the introduction of the BCAS **Autolaunch Program** extending the radius of expedited primary transport of trauma patients throughout the Health Authority with the exception of the Central Coast. Under the Autolaunch Program, 45 severely injured trauma patients were primarily transported by helicopter to VGH in 2006-07, since introduction of the program in June 2006, shaving hours off their time to definitive care. Of these, 28 came direct from the incident scene and 17 were rendezvous at primary centres. Seven of the 45 patients came from other health authorities, 3 because of quaternary type injuries.

Trauma Centre Access

All patients meeting field triage major trauma criteria presenting by ground or helicopter transport are guaranteed immediate access to VCH/BCCH trauma centres under **Regional Life Limb and Threatened Organ** (LLTO) no refusal policies implemented in April 2006 (pediatric) and May 2006 (adult). Interfacility transfers for quaternary care are also protected under LLTO.

Injury Epidemiology

Death from Injury

BC has one of the lower death rates from injury in Canada based on last census data (Health Canada, Figure 1.) Unintentional injury (e.g. falls, MVC, etc.) accounts for nearly two thirds of all deaths in VCH with suicide accounting for 28% and homicide for another 5%. Statistics for BC are very similar (Figure 2). VCH has the lowest death rate due to MVC in BC (Figure 3).

Figure 1. Injury Death Rates in Canada (Health Canada, 1992)

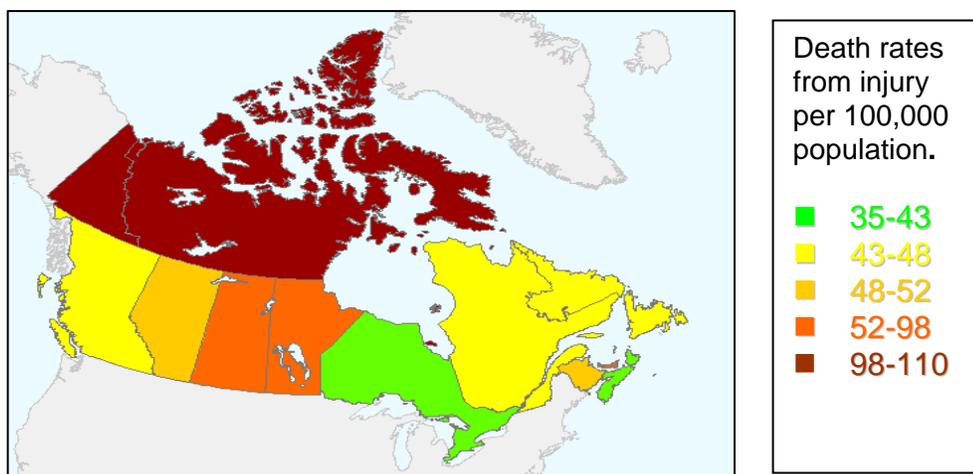


Figure 2. Death Class Type for VCH (BC Coroner 2006)

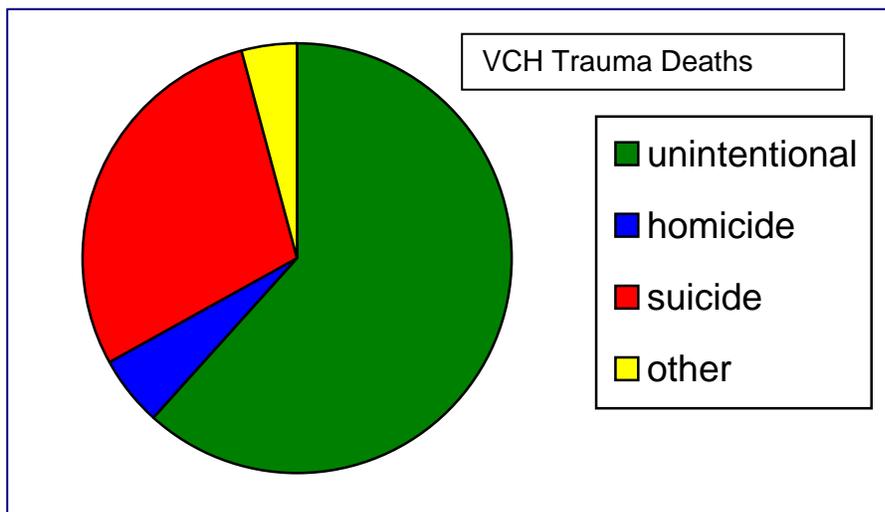
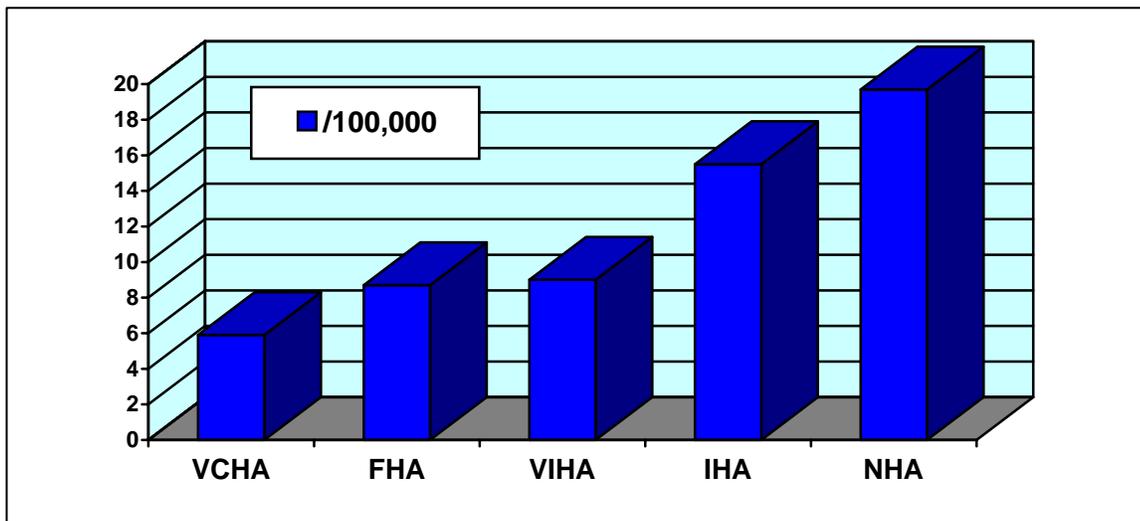
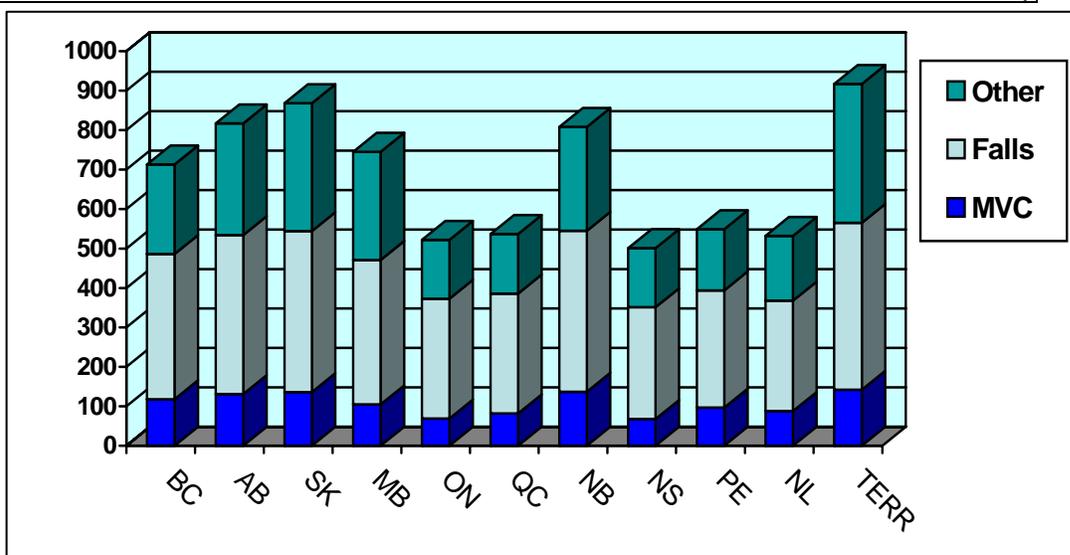


Figure 3. Death Rates due to MVC by Health Authority (BC Coroner 2006)



Hospitalisations for Injury: Injury hospitalization rates vary across Canada (Figure 4) and across BC and our own Health Authority with the relatively urban lower mainland having low hospitalization rates for injury while rural areas (e.g. Central Coast) have high rates. The overall hospitalisation rate for injury in VCH is approximately 500/100,000 which compares well to national and provincial data.

Figure 4. Hospitalisation Rates for Injury in Canada 2001-02 (NTR 2004 Report)



Hospitalisation rates for injury in BC are higher than the national average of 606/100,000 though are much lower in VCH (500/100,000 approximately).

Regional Trauma Services Activity

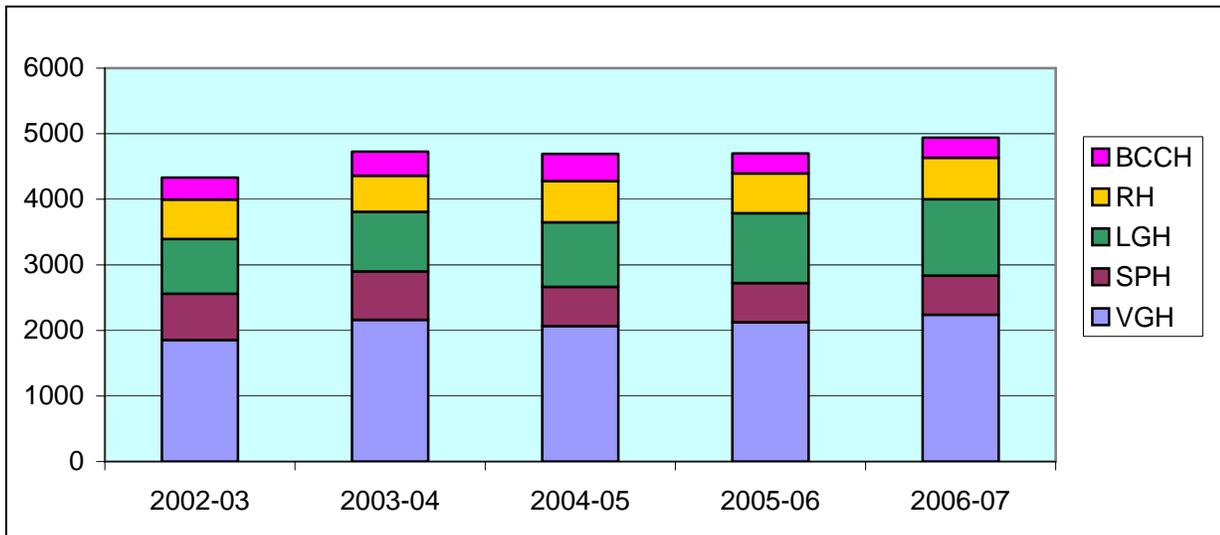
Trauma Caseload

1. **Total Trauma Caseload (Admitted patients only):** The total regional trauma caseload has been increasing relatively slowly over the last 5 years consistent with declining national injury trends offsetting the growing population (Figure 5). Population and current trauma caseload are consistent with a sustainable independent regional trauma system in VCH. There is currently no consistent data collection for ambulatory trauma care visits within VCH and BC and therefore no reporting on this activity.
2. **Major trauma caseload:** VCH uses several definitions for major trauma depending on circumstance, including:
 - a. Field Triage Guidelines: Physiologic, Anatomic & Mechanism criteria
 - b. Transfer Guidelines: Physiologic, Anatomic criteria
 - c. Trauma Team Activation: Physiologic, Anatomic criteria
 - d. Caseload reporting: MCC 25 (reported by QUIST)
 - e. Caseload reporting: ISS>15 (reported by BC Trauma Registry)
 - f. Caseload reporting: ISS>12 (reported by National Tr. Registry)

This major trauma caseload in VCH (as measured by Injury Severity Score or ISS of >15) has been stable with approximately 700 cases a year in the region including pediatric cases. The majority of adult major trauma patients (550 cases) are admitted to VGH, another 100 to SPH and LGH along with the 40-50 pediatric cases to BCCH. (Figure 6.)

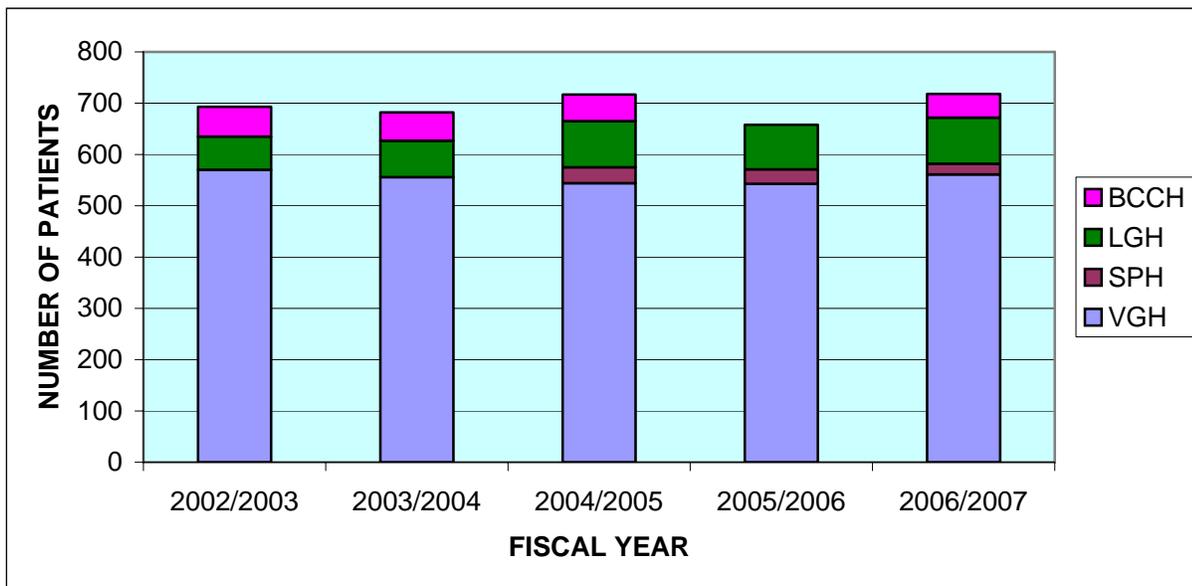
3. **Non-major (Secondary) trauma caseload:** Unlike major trauma, the secondary trauma caseload (approximately 4,200 cases) remains distributed to all major acute care facilities in the region, predominantly to the designated tertiary and district trauma centres (Figure 7). This distributed model is essential in order to maintain capacity at the tertiary trauma centres for major trauma patients, maintain system flexibility and surge capacity as well as fully utilizing specialty services at each site. Non-major trauma accounts for the large majority (>90%) of the trauma caseload at St. Paul's Hospital (SPH) and Lion's Gate Hospital (LGH), and essentially 100% at Richmond Hospital (RH).
4. **Quaternary trauma caseload:** Some low incidence, high acuity or complex injuries are uniquely provided by the adult (VGH) and pediatric (BCCH) provincial trauma centers. This subset of the tertiary caseload, or quaternary care, includes spinal cord injury, burns, endovascular services, along with complex orthopedic, plastic and torso trauma and neuro-interventional services. Quaternary admissions to VGH are shown in Figure 8 and account for a large proportion of major trauma.

Figure 5. VCH/BCCH Total Trauma Caseload for 2002-03 to 2006-07 (QUIST)



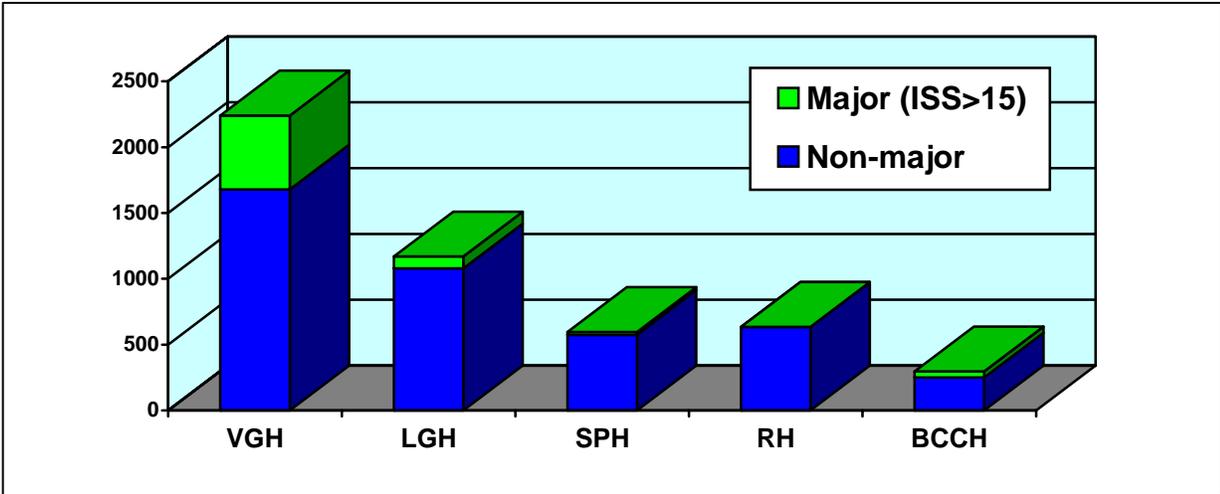
(BCCH: BC Children’s Hospital, RH: Richmond Hospital, LGH: Lions Gate Hospital, SPH: St. Paul’s Hospital, VGH: Vancouver General) NB only modest increase in activity despite population growth.

Figure 6. VCH/BCCH Major Trauma Caseload for 2002/03 to 2006/07 (BCTR)



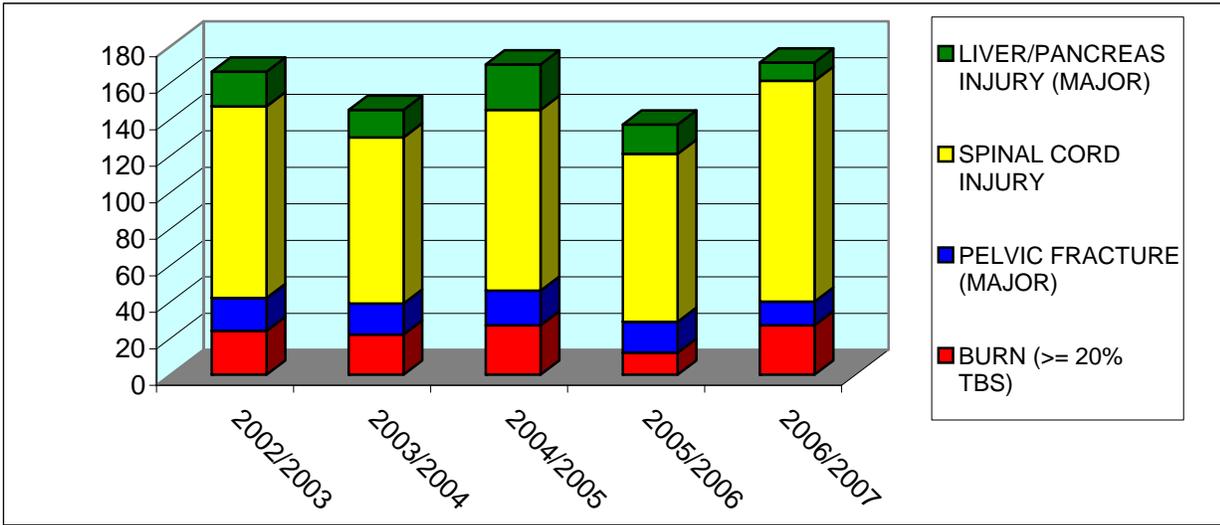
Stable major trauma caseload in VCH/BCCH Trauma System. (Note: missing data for some years for BCCH and SPH. RH has no major trauma).

Figure 7. Major and Non-major Trauma Caseload by Site. (BCTR)



Adult major trauma is mostly consolidated at VGH supported by LGH with very few cases at SPH & RH. Non-major trauma is distributed across the entire system ensuring system flexibility & surge capacity.

Figure 8. Quaternary Trauma Caseload, VGH. (BCTR)

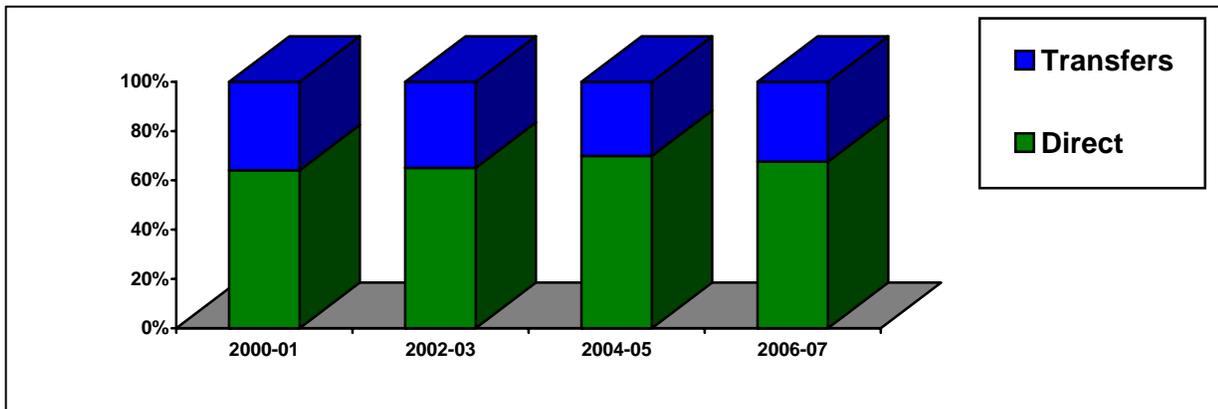


Patients with quaternary injuries are uniquely served within BC at VGH (BCCH) where these services are available. Access is guaranteed under regional LLTO policies.

Patient Origin: The majority of trauma patients admitted to the regional trauma system arrive by direct transport from the scene of injury by BCAS ground. About one third arrive by transfer from another institution. This proportion has been declining over the last few years as trauma systems in other BC health authorities mature and develop their own LLTO guidelines for tertiary trauma. (Fig 9)

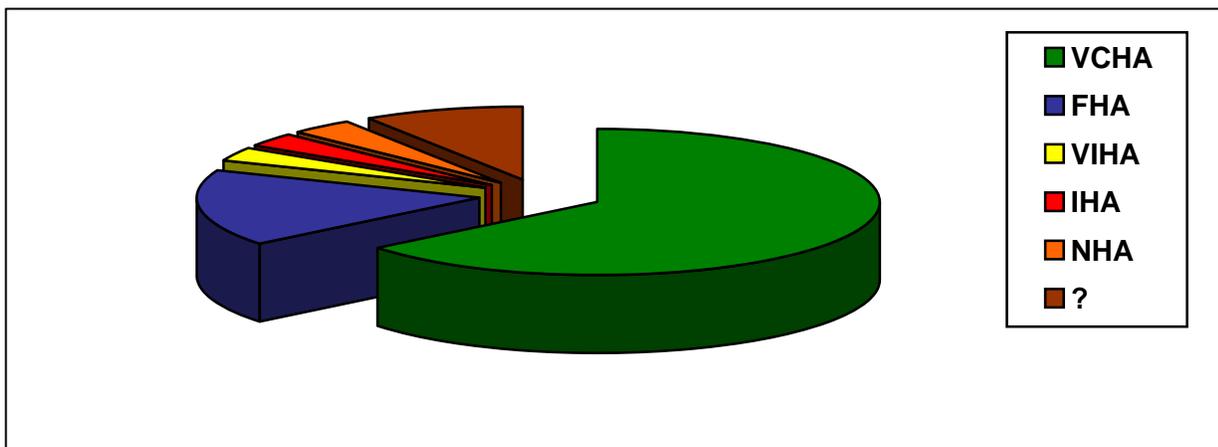
Similarly, the majority of admissions to the tertiary trauma centres are patients who reside within the health authority boundaries. Around one third live in other Health Authority regions. Some of these patients are transferred in for unique (quaternary) services provided by VGH and others are injured while traveling or working within the VCH boundaries (Fig 10). BC Children’s receives patients from all across the province consistent with its provincial tertiary mandate (Fig 11, 12).

Figure 9. Patient Origin by Scene vs. Transfer (BCTR)



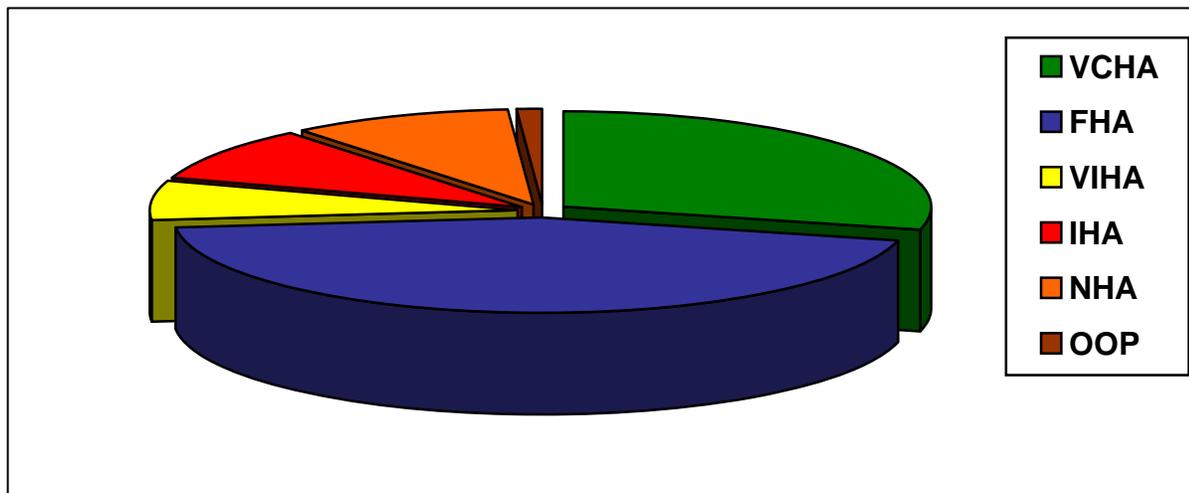
Proportion of trauma admissions that are direct admissions from scene or are transfers from within VCH or other health authorities.

Figure 10. Patient Origin by Place of Residence (VCH), 2006-07 (QUIST)



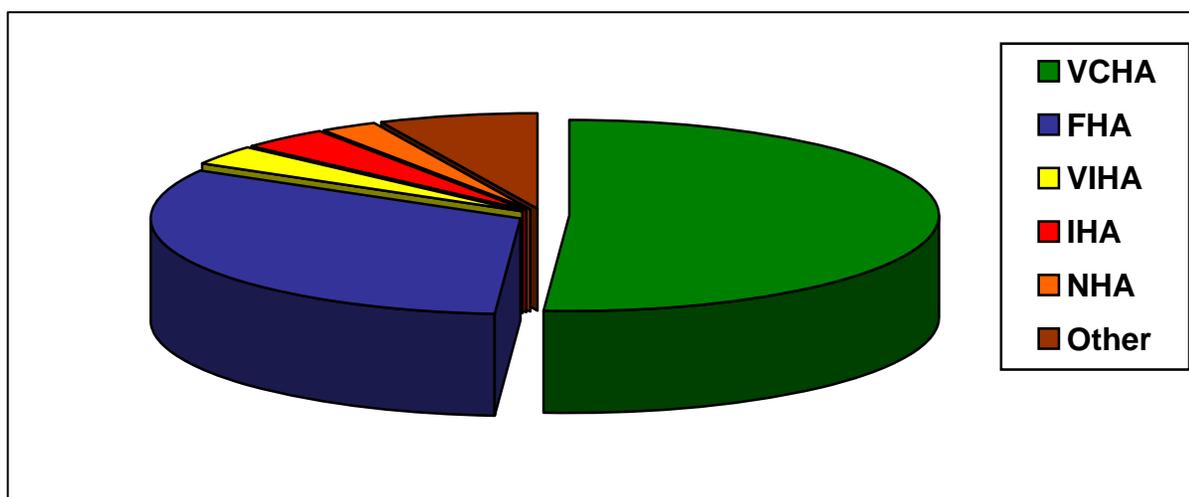
Approximately one third of trauma admissions to VCH are patients who reside in other health authorities – see text for explanation.

**Figure 11. Pediatric Trauma Patient Transfers to BCCH:
 Origin by Health Authority of Transferring Centre (BCCH)**



BCCH receives trauma transfers from across the province with FHA and VCHA accounting for nearly 75%. (OOP=Out of Province)

**Figure 12. Pediatric Trauma Patient Discharges from BCCH
 By Health Authority of Residence (BCCH)**



Patients residing in VCH and FHA account for >80% of pediatric trauma patients discharged from BCCH.

Caseload Description

Injuries are globally defined as being intentional vs. unintentional (the preferred term over 'accidental' since most injuries are considered to be preventable to some degree and therefore not accidents). Intentional injury is further divided into self-inflicted (e.g. suicide) or third party (e.g. assault, homicide)

Intentional Injury: Despite the headline grabbing hype surrounding intentional injury and interpersonal violence, we remain blessed with low hospitalisation rates for this type of injury (Fig 13). The low rate of admission for self-inflicted intentional injury, however, belies the tragically high suicide death rate reported by the Coroner's Office (see Figure 2 in section C). This silent epidemic receives little public attention, in part due to reporting restrictions. Fortunately, due to a variety of preventative measures, suicide rates are also declining.

Figure 13. Injury Admissions by Intent (Unintentional vs. Intentional) (BCTR)

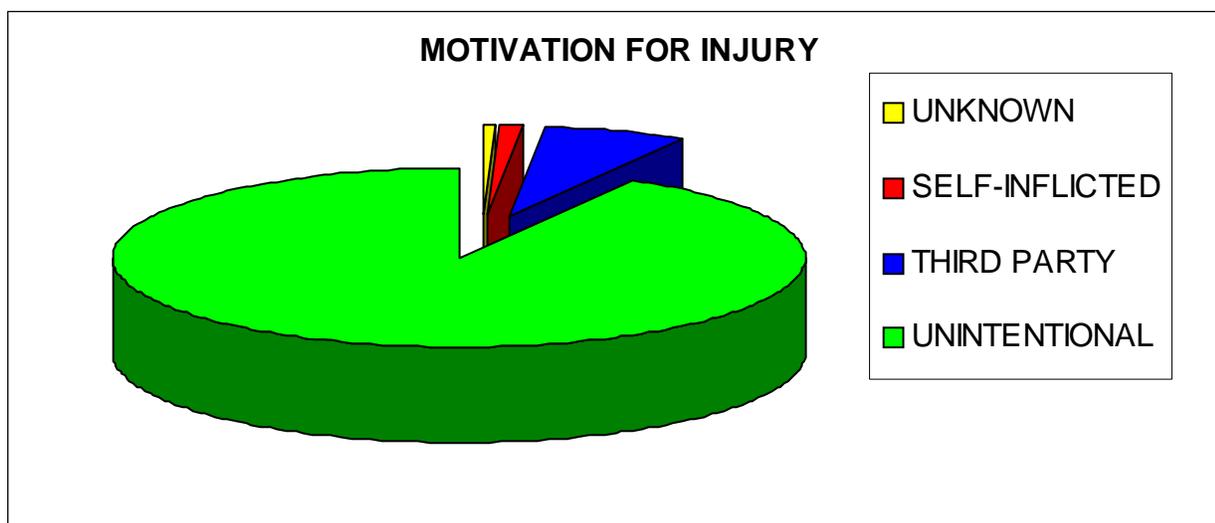
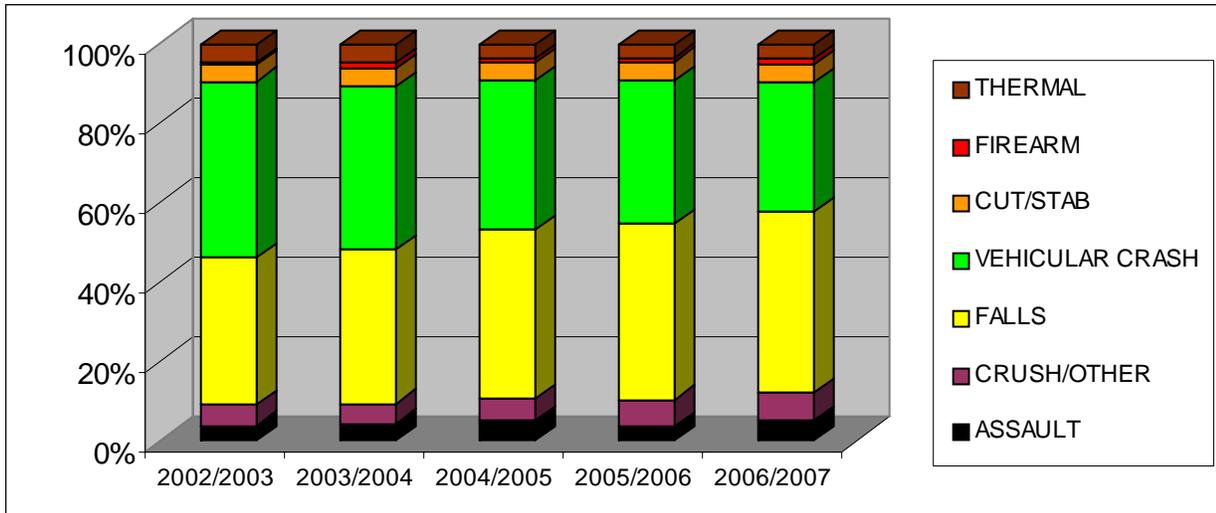


Fig 13. Unintentional injury, including falls, motor vehicle and industry related trauma, accounts for the majority of trauma centre admissions. These data differ from those reported by the BC Coroner's Office where suicide accounts for a much larger proportion of trauma related deaths.

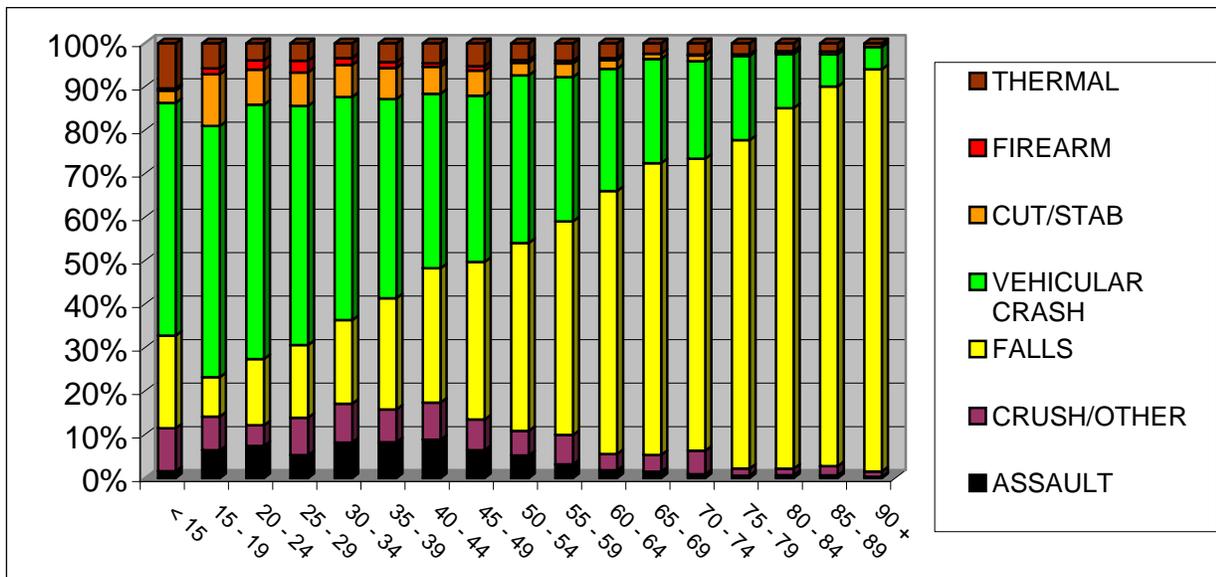
Unintentional Injury: VCH Trauma Program predominantly serves a population sustaining blunt force unintentional injury, consistent with the experience of most Canadian Centres. Falls and motor vehicle collisions account for the majority of hospitalized trauma patients with falls, especially in the elderly, assuming a greater percentage of admissions over the last 5 years. (Fig. 14, 15)

Figure 14. Percentage Injury Admissions by Mechanism (BCTR)



(Fig 13) Elderly patients sustaining injury from falls form an increasing % of trauma admissions

Figure 15. Percentage Injury Admissions by Mechanism and Age (BCTR)



(Fig 14) Common mechanisms of injury vary according to patient demographics with falls predominating in the elderly and motor vehicle crashes predominating in the early and middle years of life. (BCTR 2006-07 data)

Performance Improvement and Patient Safety (PIPS)

The VCH Trauma Program is committed to establishing best practice in trauma care throughout the system and has implemented an integrated Performance Improvement and Patient Safety (PIPS) Program. Clinical practice guidelines have been implemented system-wide (see web site - www.vch.ca - for full list) and performance is monitored through a variety of process and outcome measures. This rigorous program relies on the vision and hard work of the site Trauma Program Managers, aided by the site Trauma Directors and supported by the BC Trauma Registry.

Process indicators are chosen to identify system delays and errors across the system that could contribute to excess mortality and morbidity. Some indicators are collected region wide others are site specific. Regional indicators include (see Table 1.):

1. Delays in Trauma Team Activation.
2. Delays in consultation.
3. Delays to the operating room.
4. Delays in diagnosis.
5. System delays (e.g. referral, transport, resource availability e.g. CT/OR).
6. Missed diagnosis.
7. Errors in technique, judgment, diagnosis, communication.
8. Compliance with clinical practice guidelines (CPGs).

Outcome measures are chosen to measure how well patients do after injury (e.g. survival, discharge disposition) or how efficiently the system is able to care for them (ALOS). There is a need to improve the measurement of function patient outcomes to better assess residual physical and psychological disability following injury though this work is resource intensive and not currently collected or funded except for isolated patient subsets. Outcome measures currently routinely collected include:

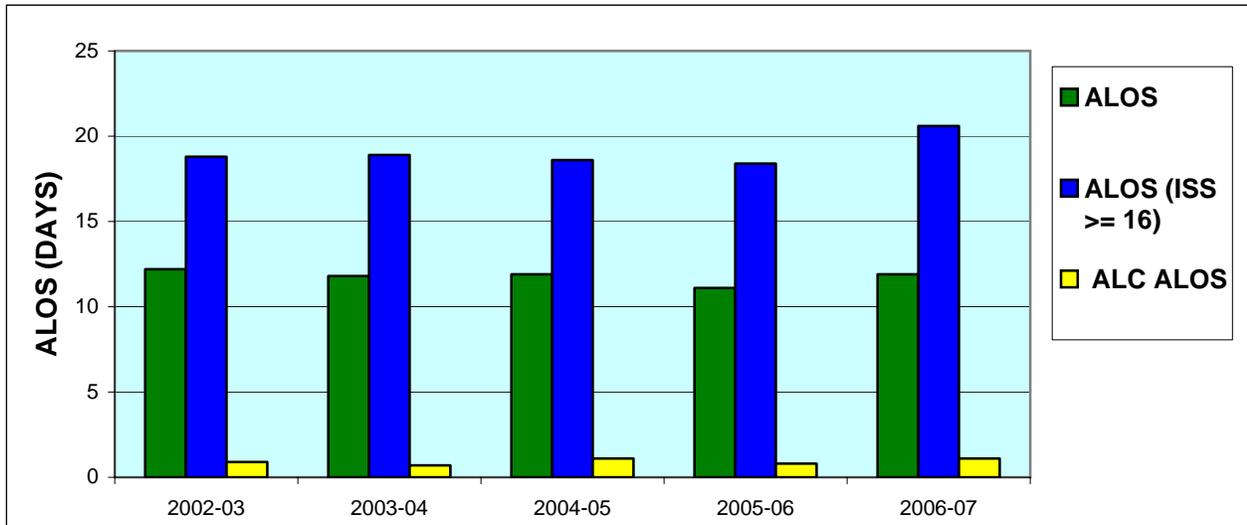
1. Length of stay (overall) Fig 15.
2. Length of stay (Adjusted to Injury Severity Score) Fig 15.
3. ICU length of stay (not reported on but available).
4. Alternate level of care (ALC) average LOS. Fig 15.
5. Discharge disposition (an indicator of functional status at discharge) Fig 16.
6. Crude mortality rates Fig 17.
7. Risk adjusted injury mortality (TRISS methodology) Fig 18-20.
8. Functional outcome measures (pilot projects on subsets of patients only).

Table 1: Audit of Process indicators for 2006 and 2007.
 (Regional data based on focused audits with *ranges between sites*)

Code	<u>Regional Trauma Audit 2006</u> <u>All 4 sites- VGH, BCCH, SPH, LGH)</u>	2006	
		Region	Range
9002	Total Number of pts who met TTA criteria	88	
	Total Number of Actual TTA's (including delays)	71	
	Of Above, Total # of delayed TTA	0	
	Total Number of Missed TTA's (9002)	17	
	No documentation	0	
	Regional Trauma Indicator % (Target: <30% Delay in Activation)	19%	(4-41%)
9004	Total Number of Delays in TTA's - MD Response (Facility Guidelines)	2	
	Regional Trauma Indicator % (Target: < 30% MD Delay in Response)	2.27%	(0-3%)
9005	Total Number of Patients Meeting Trauma Consult Criteria (Facility Guidelines)	113	
	Total Number of Missed Trauma Consults (Facility Guidelines)	8	
	Regional Trauma Indicator % (Target: < 30% Missed Trauma Consults)	7%	(2.3-23%)
9001	Total Number of Patients Admitted from ED	169	
	Total Number of Delays to Disposition (>4hrs)	35	
	4-8 hrs	22	
	>8hrs	13	
	No Delay to Leaving ED (<4 hrs)	134	
	Regional Trauma Indicator (Target: > 70% <4hrs To ED Discharge)	79	(22-84%)

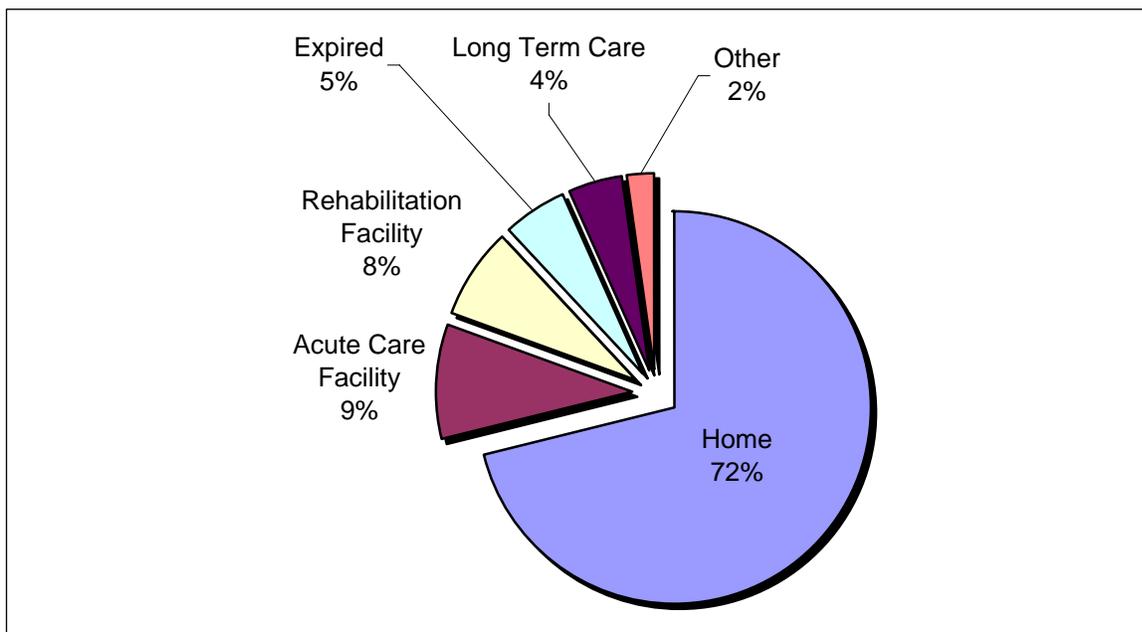
Given the high compliancy rate with all performance indicators presently collected the RTP members' determined that for the 07/08 reporting year the overall benchmarks would be increased to 80% compliance in all areas.

Figure 15. Average length of hospital stay, ALOS (QUIST/BCTR)



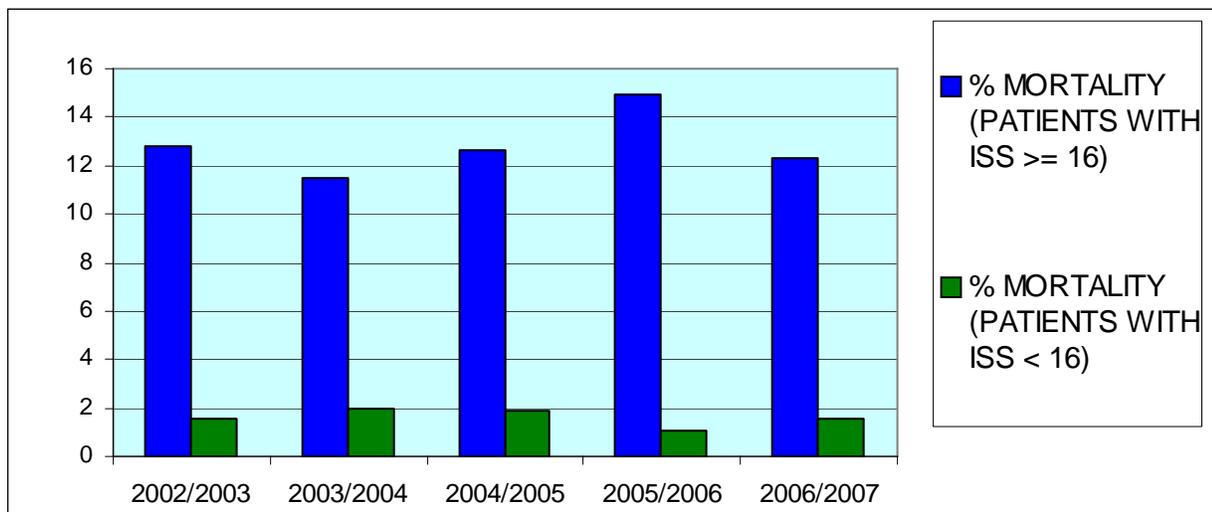
ALOS has not changed over the last 5 years and reflects many resource related issues including access to rehabilitation, convalescent, and community services.

Figure 16. Discharge Disposition VCH Trauma Patients (BCTR)



Only 8% of trauma patients are able to access rehabilitation services in VCH. The majority completes their recovery in VCH acute care facilities or are repatriated to their hospitals and HAs of origin.

Figure 17. Crude Injury Mortality Rates by Injury Severity Score (BCTR)



Hospital mortality rates for trauma patients and the cohort of more seriously injured with ISS Scores >15 have varied little over the last five years but are improved over those of a decade ago. Risk or acuity adjusted mortality rates shown below give a more accurate picture of performance.

Risk adjusted mortality is calculated utilizing TRISS methodology as a benchmarking tool to define performance against an historical international benchmark, the Major Trauma Outcome Study (MTOS). TRISS uses the anatomic Injury Severity Scale (ISS) Score, the physiologic Revised Trauma Score (RTS) and Patient Age to calculate individual patient survival probabilities.

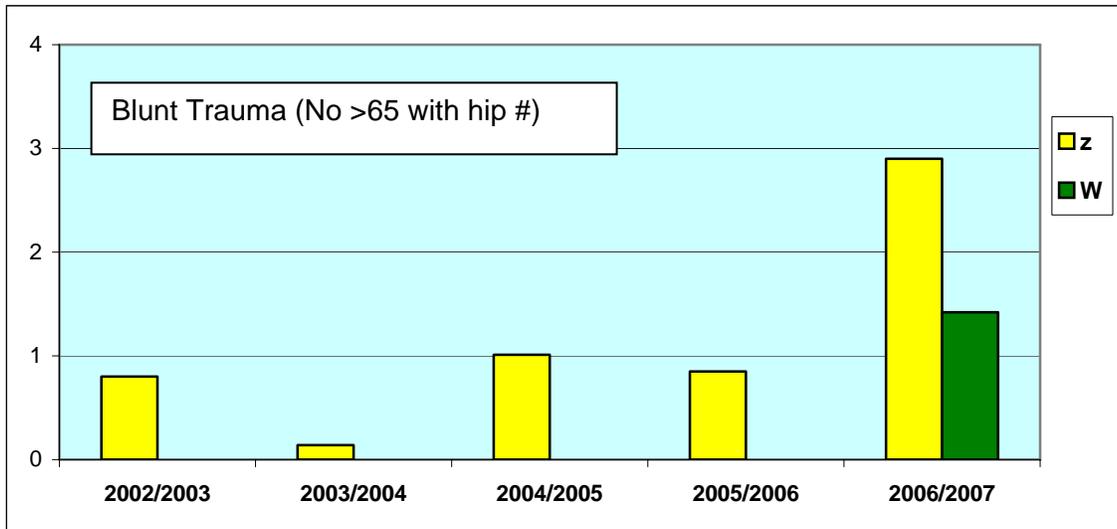
The TRISS z statistic indicates whether the number of observed survivors in the trauma system exceeds (+) or is less than (-) what would be predicted based on patient outcomes in the MTOS.

As can be seen for the following charts, VCH z scores are positive for all years indicating trend to improved survival over predicted outcomes (Figures 18. & 19.)

The TRISS W statistic is reported when the z score is either >1.96 or < -1.96 indicating statistical difference from MTOS norms (+ is better, - is worse) The W score indicates the number of additional (unpredicted) survivors (+) or deaths (-) per 100 trauma admissions.

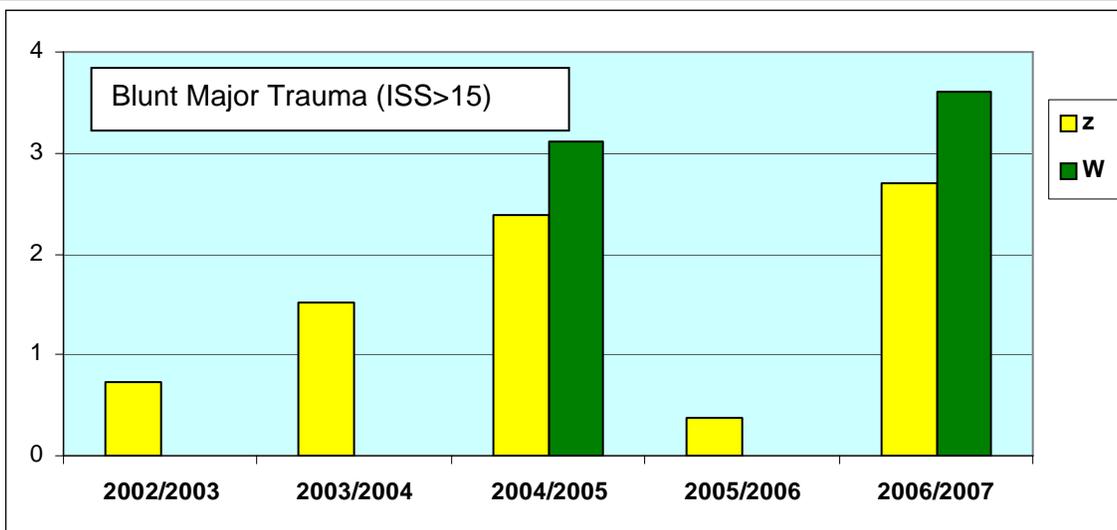
The data show that survival is improving for patients with severe blunt injury over time across the trauma system as a whole with increasing numbers of unexpected survivors. Survival outcomes for major trauma at our adult tertiary trauma centre (VGH) are exceptional (Figure 20). Pediatric trauma z scores at BCCH have also been consistently positive, though data are lacking for the some recent years (Figure 21). The penetrating trauma caseload is too small to reliably report performance.

Figure 18. VCH Risk Adjusted Mortality vs. MTOS (BCTR)



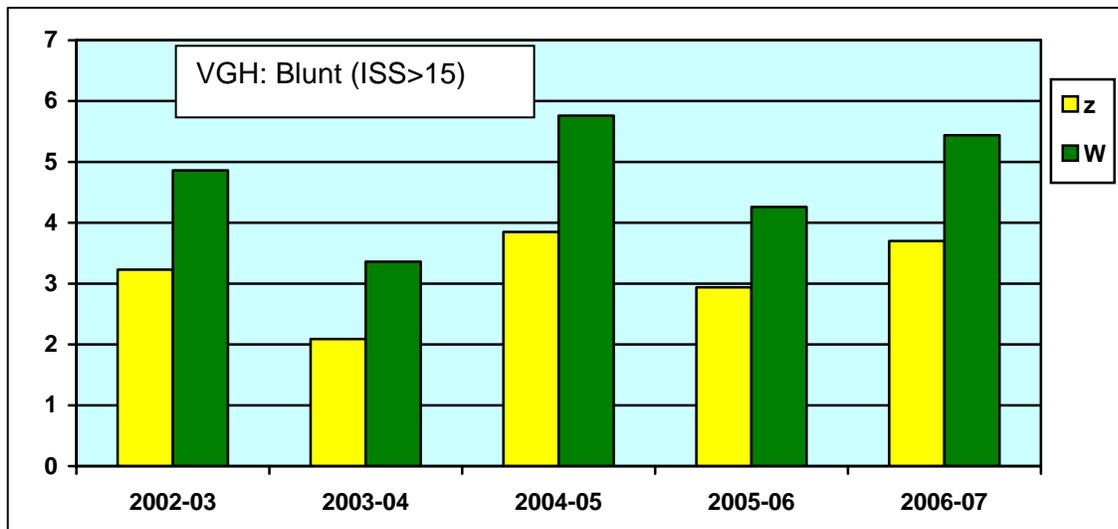
Positive z scores indicate improved survival compared to the benchmark Major Trauma Outcome Study with W scores indicating the number of increased survivors per 100 admissions (W reported only when z reaches statistical significance).

Figure 19. VCH Risk Adjusted Mortality vs. MTOS for ISS >15 (BCTR)



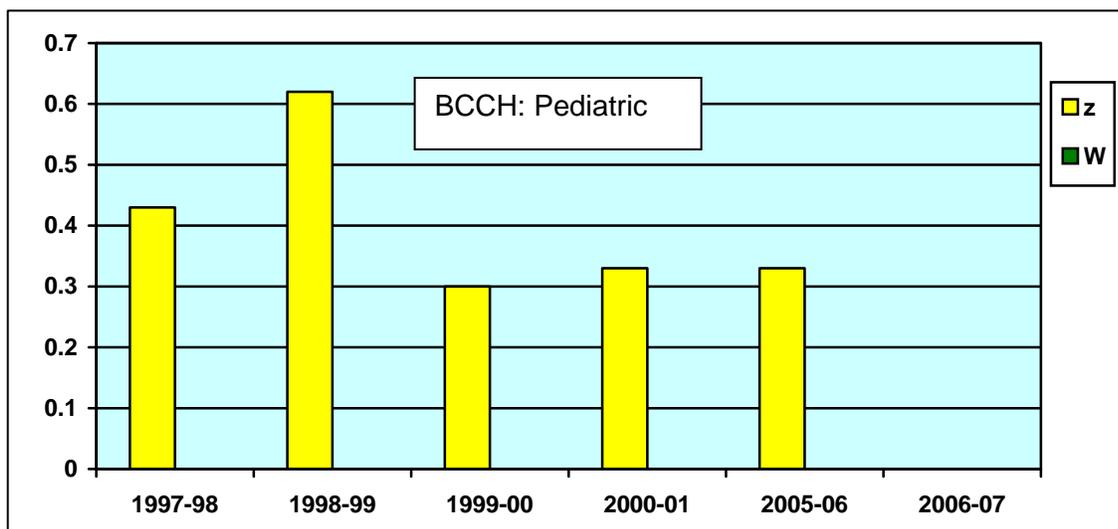
Survival for major trauma patients managed in the VCH Trauma System has improved significantly in recent years (positive z scores and W statistics).

Figure 20. VGH Risk Adjusted Mortality vs. MTOS for ISS >15 (CCEE)



Reported survival following major blunt trauma at VGH is consistently and significantly better than that reported by MTOS. W statistics indicate number of unexpected survivors per 100 admissions.

Figure 21. BCCH Pediatric Risk Adjusted Mortality vs. MTOS (BCTR)



Pediatric trauma z scores for BCCH are positive but, due to small caseload, fail to reach statistical significance compared to MTOS data. Data is missing for some recent years.

Education and Training Initiatives:

UBC undergraduate, postgraduate trauma training programs. The consolidation of most major blunt trauma in the VCH region to one site (VGH) has allowed for the development of specialty trauma services and dedicated trauma units. These permit development of comprehensive training programs for undergraduate medical training (UBC), postgraduate (residency and fellowship) training and the first ever civilian based Canadian Forces Trauma Training Centre. UBC related trauma-training courses include:

- Trauma Evaluation and Management (TEAM) – undergraduate: 6/year
- Advanced Trauma Life Support (ATLS) - postgraduate
- Trauma Labs - postgraduate

Educational outreach programs are critical to trauma care providers in rural and remote communities in addition to practitioners working in the field of trauma. Courses run over 2006-07 include;

- **Advanced Trauma Life Support (ATLS)**
 - 8 Provider Courses
 - 2 Instructor Courses
- **Trauma Nurse Core Course (TNCC)**
 - 7 Provider courses
 - 1 Instructor course
- **Definitive Surgery for Trauma Care (DSTC) Course**
 - 1 Provider course in collaboration with McGill

Regional Trauma Rounds: Regional Trauma Rounds continue monthly by each of the major VCH trauma centres rotation and are available through Telehealth to all Primary Trauma Centers as all VCH acute sites are now equipped with Telehealth equipment and capability.

Canadian Forces Trauma Training Centre (West). The CFTTC(W) is a tremendous credit to the VCH Trauma Program being a first of its kind in Canada joint civilian/military trauma training facility. This Training program continues to support CF physician assistant (PA) training, maintenance of skills, as well as pre-deployment preparation for our Canadian mission in Afghanistan. This includes training in both adult and pediatric trauma. Several military medical personnel work at VGH and are periodically deployed to Afghanistan or to other missions. During 2006-07, CFTTC(W) can be credited with:

- PAs trained: 6 students, 4 maintenance of competence rotations
- Intensive Trauma Team Training Courses (pre-deployment): 5
- VGH/CFTTC personnel deployed to Afghanistan: 10

Injury Prevention

BC Injury Prevention Centre (BCIPC), part of VCH Trauma Program, is located at VGH and is under the direction of Ms. Mary Ellen Lower. It has continued to promote its “*Spirit to Survive Campaign*” this past year in collaboration with renowned local adventure sports individuals. Details and other innovative prevention programs can be found on BCIPC’s ever expanding and interactive web site, www.injuryfreezone.com

BC Injury Research and Prevention Unit (BCIRPU) is a provincially funded injury surveillance and prevention coordinating centre located on the BCCH Campus. There has been increasing collaboration between the BCIRPU and the VCH Regional Trauma Program over the last year with joint CIHR grant submissions and joint research programs. A more comprehensive overview of BCIRPU activities can be gleaned from the website: www.injuryresearch.bc.ca

The BC Trauma Registry (BCTR)

The BCTR is a province-wide program, funded directly by the Ministry of Health and administered through VCH. It is currently installed in all of the designated tertiary and district trauma centres in BC, some 9 hospitals in total, from across all of BC’s Health Authorities. The central site is located at Trauma Services, VGH.

The BCTR augments the hospital Discharge Abstract Data (DAD) dataset by collecting detailed information on a subset of major trauma patients admitted to BC’s trauma centres. This comprehensive dataset on the most severely injured of our patients is utilized extensively for program reports, system planning, performance improvement, research, injury prevention, resource utilization and patient care. As such it is an indispensable component of the hospital, regional and provincial trauma programs.

The BCTR supports several other trauma related registries including the National Trauma Registry (CIHI) and local spine and orthopedic trauma registries.

The BCTR has recently gone through an external review following the TAC Accreditation in 2005. The main goal for BCTR in 2006-07 has been implementing the Review’s recommendations, specifically to modify the dataset and inclusion criteria, expand the dataset to include ICD diagnostic, intervention, and complication codes and to bring on the newly designated trauma centres.

BCTR data has been used extensively in this report without which our activity and performance could not accurately be reported on. For more information on the BCTR, contact Ms. Nasira Lakha, Manager BCTR, at Nasira.Lakha@vch.ca.

Research Activities

New knowledge, particularly about the care we provide, is essential to ongoing system improvement. Throughout the regional program there are active research initiatives investigating new and better ways to care for our patients. Support for these activities comes from federal and provincial granting agencies along with local support from the Hospital Foundations and individual programs

A. Multicentre randomized clinical trials:

1. Resuscitation Outcomes Consortium (ROC): Acute care facilities throughout VCH and BC are participating in this multicentre trial of pre-hospital hypertonic saline resuscitation.
2. Factor VII studies: VGH is one of several international trauma centres participating in a trial of Factor VII in hemorrhage and head injury.

B. Epidemiology: Trauma systems and access to care

The VCH Trauma research program has a major focus on access to care and trauma systems in BC and Nationally. This work has attracted funding from CIHR, MSFHR and BC health authorities (VCH and NW Regional Hospital District). Current projects include:

1. Access to care for trauma patients in NW of BC.
2. Access to trauma centres in Canada.
3. Trauma systems implementation across Canada.
4. Application of geo-social sciences to trauma epidemiology.
5. Geographical and socioeconomic determinants of injury.

C. Clinical Research

Many of the surgical subspecialties have ongoing clinical research projects related to trauma care and outcomes. Several resident research projects have been fostered and resulted in national presentations. Current clinical studies under investigation by the VGH/UBC Trauma Program include:

1. Hepatic injury management and outcomes.
2. Winter sports injuries.
3. Aortic and pelvic injuries.
4. Pedestrian injury.
5. Injury from interpersonal violence.
6. Tertiary survey and missed injuries.
7. Trauma team composition and patient outcomes.
8. Survival following head injury in remote communities.
9. Autolaunch program and impact on pre-hospital times.

Trauma System Accreditation

The VCH Trauma System was successfully accredited by the Trauma Association of Canada (TAC) in 2005 and received distinction in some specific areas and overall. Several recommendations were provided by the accreditors to further improve performance and should be fully addressed by the time of re-accreditation by TAC in 2010.

Most of the 2005 recommendations for the system and individual trauma centres have now been implemented or are in progress. Two major regional recommendations remain unaddressed however:

- I.) Address the gap in the provision of trauma rehabilitation services within VCH, and
- II.) Refresh the ten-year-old BCAS Code 99 Protocol (pre-hospital triage and transport algorithm for Trauma patients within Vancouver's lower mainland).

I.) Timely access to Rehabilitation Services has been identified as a gap by all acute programs within VCH (including trauma services) for several years and was flagged by TAC accreditors as a priority for system improvement. There have been several regional reviews of Rehab Services but with little forward movement towards improved access. The senior leadership within VCH is aware of the challenges facing this important part of the trauma continuum of care. There are several initiatives in play that will address specific populations requiring rehabilitation services but trauma has not been identified as one of the services for this year. It is vitally important to the recovery of trauma patients (and successful accreditation in 2010) that this deficiency is addressed.

II.) Updating the Code 99 transport protocol is dependent on the system optimization work by the Regional Trauma Program (RTP) (Section J). Clear understanding of site roles and case mix within the system are prerequisites to re-defining pre-hospital triage, transport and hospital destination guidelines. This work will be advanced by trauma leadership from both VCH and FHA as revision of this protocol will affect both Health Authorities. Included in this revision will be Autolaunch criteria previously non-existent in 1996 Code 99 document.

Individual sites within the VCH/BCCH Trauma System have made good progress in addressing their own recommendations from the 2005 TAC accreditation, BCCH reports 24% complete and 57% in progress as of year-end.

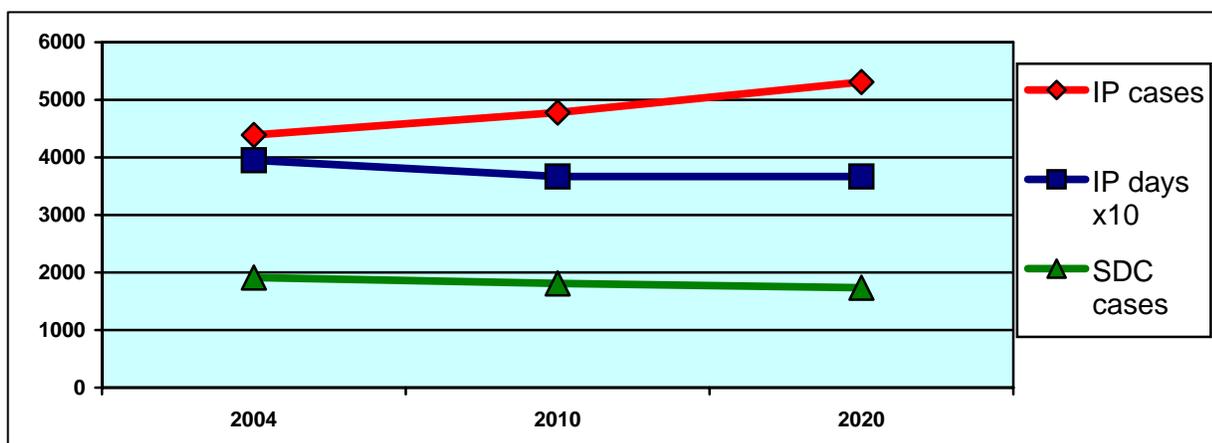
Re-accreditation by TAC in 2010 will be based on the new guidelines published by TAC in May 2007 and will have an increased focus on system functionality and patient outcomes. This new emphasis by TAC on systems and outcomes is aligned with the VCH system redesign initiative discussed in the following section and positions VCH for a successful re-accreditation once this work is completed and implemented.

Strategic Planning Initiatives

Crafting a Regional Trauma System that places the “the right patient, in the right place, in the right time, first time” is our primary goal. i.e. ensuring rapid transport of trauma patients to their required level of care within the system to ensure that best possible outcomes are realized.

The regional Trauma Program (RTP) through its Regional Trauma Working Group (RTWG) has articulated a model of trauma service delivery across the health authority looking at the capacity and service adjacencies in each acute facility within VCH based on the existing trauma numbers as well as population demand modeling for the next 20 – 30 years (Fig 22).

Figure 22. Population Demand Modeling for Trauma Caseload (VCH)



The good news Trauma story within VCH, as across Canada, is that injury rates are decreasing due to the successes of injury prevention measures such that injury admission rates remain flat despite an increasing population (Fig 5, 6). It is evident that there is no need to build significantly more capacity than that currently required for optimal trauma care.

Defining the service levels and optimal resources to ensure best practice and superior patient outcomes has been the major work of the program for 2006-07. Our work has also focused on the need to ensure a sustainable system while preserving system flexibility to respond to caseload fluctuations and mass casualty events. The process has also addressed diverse issues such as recruitment and retention, DI, lab and specialty services along with site integrity. The ultimate goal of this work is ensure a sustainable system that delivers the best outcomes for the trauma population irrespective of where and when their injury occurs.

Our rural and rural remote sites will maintain the service delivery for initial trauma care for their communities with expedited transport to the tertiary and district centers. On site education and “real time” support for the resuscitative period prior to transportation are critical to their success in this work.

The VCH Regional Trauma System optimization work has defined three levels of trauma services and the associated adjacencies and personnel required to ensure best outcomes for the patients. We

have further refined these services into the resuscitative capabilities as well as the definitive care delivery and mapped them for each of our acute care facilities within VCH. We have also ensured that this mapping is also congruent with new TAC Trauma System Guidelines and trauma centre definitions. This has assured alignment between the care requirements, site capabilities, national guidelines, and patient outcomes. This work has moved forward but requires further validation and discussion before implementation.

Although most of this work has been done by the RTWG, we have engaged in a rigorous consultation process with the site senior leaderships and other programs and councils within One Acute Network, to ensure appropriate communication and seek opportunities for collaboration and synergies across all programs. This work will progress further in the upcoming year where the finalized regional plan for Trauma service delivery will be vetted through a decision model for clearer impacts on existing facility availability, human resources constraints and information technology demands and fiscal restraints will be factored into the final model proposed.

This modeling must also reflect the upcoming changes to the Trauma Association of Canada (TAC) accreditation process www.traumacanada.org. The RTP strategic planning initiative is fully in line with the enhanced Regional “System” perspective TAC has advocated in the new guidelines. There will also be changes to Level designation for specific sites within a system to be consistent with the new TAC guidelines and ensure best utilization of resources and minimal duplication of services.

Summary and Acknowledgements

The RTP is justifiably proud of the work outlined in this report, which documents a very high standard of clinical performance for the care of major trauma patients in VCH, and delivery of first-rate academic trauma programs. As our attention turns to further refinement of our trauma system, we will be ensuring that these outcomes are consistent for all severely injured patients across the system and also begin focusing on the less severely injured, ensuring that they are also enjoying similar superior outcomes.

The regional trauma program leaders would like to personally thank the site leaders for their commitment and hard work as well as VCH senior leadership for their support of the regional trauma program. We would also like to acknowledge the efforts of our front line trauma care providers from across all specialties and all sites for their dedication to excellence in patient care and performance improvement as manifest by the superb outcomes reported here and which stand alongside the best reported worldwide.