The 2015 annual report describes events and activities that took place within the calendar year supported by data from 2013/14. 2015 has been an exciting year of acquisition and building infrastructure for Trauma Services BC with a strategic focus on advancing:

- Optimal service delivery for BC residents reflected in the development of provincial performance indicators.
- Better integration of data sources and analytic capacity of the data collected for a meaningful reflection of our performance and outcome of our patients.
- Data sharing agreements with partners that impact patient care along the care continuum.

These specific initiatives highlight select Trauma Services BC achievements over the past year, but other areas of progress are highlighted in the subsequent pages and in the progress of our select partners.

No document is the effort of a single person, but that of a team, all of whom contribute to the tone, texture, style and content to reflect what we believe to be the collective work effort of our own Trauma Services BC council and office. Our sincere thanks to all the Trauma Services BC council members, health authority trauma leadership, and stakeholders from BC Emergency Health Services who worked with us to represent their own individual growth over this past year.

Our editor “in-situ” Mr. Beide Bekele, Trauma Services BC’s project manager, who discretely pushed us on timelines, content and continuity while working with our graphic artist, Mr. Ernest Stelzer, and PHSA communications, all of whom contributed to the look and tone of the report. Significant thanks goes to the BC Trauma Registry and Trauma Services BC office staff, BC Trauma Registry manager Mr. Jaimini Thakore and Trauma Services BC executive assistant/project coordinator, Ms. Viktoria Lichtenwald. Finally we are thankful for the leadership of our medical director, Dr. David Evans, whose vision drives our team towards a vision for trauma care that is realized in yearly achievements.

I close by acknowledging our patients and providers who drive us to improve, innovate and excel in the delivery and performance of trauma care, and ultimately aspire to the vision of reducing overall trauma/injury events for the people of British Columbia.

Catherine Jones
Executive Director, Trauma Services BC
Major trauma is the principal cause of death for people under age 45 in Canada, accounting for more potential years of life lost than ischemic heart disease and lung cancer combined. Over 400,000 people are injured yearly in BC. Of these, approximately 1,700 die, 9,000 suffer permanent disability, 32,000 are hospitalized and an estimated 41,000 potential years of life are lost. The yearly cost of injury exceeds $2.8 billion in BC and is close to $19.8 billion nationally.

Over the past 20 years, BC has invested heavily in building systems of trauma care. As in comparable jurisdictions, BC’s system of organized trauma care can be described as a collaboration of the regional health authorities and the pre-hospital system to streamline acute management of major trauma anywhere in the province. The creation of the BC Trauma Advisory Committee in 1998 brought organizational representatives together to recommend and oversee the implementation of standard practices for optimized patient care.

These practices include field triage and destination protocols, trauma centre designation and accreditation, development of regional trauma programs with strategies for coordinated care across the continuum, quality assurance, education and research. The BC Trauma Registry was established in 1992 to support these efforts with operational funding provided by the Ministry of Health and administrative oversight headquartered at the Vancouver General Hospital.

BC has an inclusive trauma structure, wherein all acute care hospitals are part of the system with an expectation of readiness to receive and redirect major trauma commensurate with resources. Led by the province’s tertiary trauma facilities, all designated centres have continued to build their trauma programs. According to Accreditation Canada’s Trauma Distinction standards, BC currently has three level one provincial referral trauma centres, four regional level two centres, five level three centres, two level four centres and 61 level five centres that are able to admit patients overnight.

### Health authority trauma centres

<table>
<thead>
<tr>
<th>Health Authority</th>
<th>Level 1–2</th>
<th>Level 3–5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraser Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interior Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Island Health</td>
<td></td>
<td></td>
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<tr>
<td>Northern Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancouver Coastal Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHSA–BC Children’s Hospital</td>
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</tr>
</tbody>
</table>
Trauma Services BC (TSBC) was formed in 2012 as a publicly-funded clinical program of the Provincial Health Services Authority (PHSA) to provide high-level system oversight, strategic leadership, and performance evaluation for major trauma care in BC. BC’s organized approach to major trauma care has evolved as an ad-hoc integration of organizations and agencies aligned in their commitment to provide effective care for major trauma patients. Twenty-two years of data collected by the BC Trauma Registry demonstrates a mature system with a caseload profile comparable to other Canadian provinces. However trauma performance expectations remain largely undefined and unevaluated.

While the advisory capacity of the BC Trauma Advisory Committee was invaluable in launching an integrated and pre-planned system of organized major trauma care for BC, it had no operational mandate to assure performance standards, no fiscal control and no reporting obligation. In 2007, recognizing the need for more authoritative and accountable stewardship of the trauma system as a unified whole, the BC Trauma Advisory Committee proposed the establishment of a provincial trauma coordinating office to BC’s Ministry of Health. This proposal eventually established the ground work for the creation of Trauma Services BC.

In 2012/13, following the consolidation of the BC Ambulance Service and the BC Patient Transfer Network into BC Emergency Health Services (BCEHS), and the positioning of BCEHS within the PHSA, the BC Trauma Advisory Committee was dissolved and Trauma Services BC was established under PHSA.

Trauma Services BC has been accorded operational oversight of the provincial trauma registry and administers a budget reconstituted from historical monies as well as an operational budget for start-up from PHSA. BC is now in a position to work towards a consolidated and fully integrated trauma system that is truly performance driven, aligned with organizational priorities and accountable under centralized leadership and shared governance.

Because trauma can affect people of all ages, the impact on life years lost is equal to the life years lost from cancer, heart disease and HIV combined.1
Vision for BC’s trauma system

Trauma Services BC’s long-term vision is that – through an integrated system of injury care, control and prevention strategies – British Columbians enjoy the lowest burden of injury in North America. While aspirational, we believe that this is ultimately achievable through wide engagement of key partners in injury care and public health across BC. A well-functioning provincial trauma system is an absolutely critical element in this vision.

Trauma Services BC’s mission is to develop and support optimal performance of an integrated trauma system for BC. This directive requires clear definition of the system, its collective performance objectives, and an evaluative methodology and infrastructure to gauge how well these are accomplished.

Mission
Trauma Services BC is responsible for ensuring optimal performance of the BC Trauma System

Vision
Through effective injury care, control and prevention, British Columbians will enjoy the lowest burden of injury in North America
The BC government indirectly influences the system of trauma care and injury management through the Ministry of Health by engagement and fiscal support of the health authorities, and the Ministry of Justice through oversight of public security, coroners services and provincial emergency management.

Trauma Services BC’s mandate is to engage partner organizations in the promotion of optimized trauma care throughout BC. Its leadership, consisting of an executive director (1.0 full-time equivalent) and a medical director (0.4 full-time equivalent), works with trauma leadership designates from all of BC’s six health authorities and with partner organizations to assure the delivery of comprehensive and inclusive trauma care to all residents.

Trauma Services BC’s operational model ensures engagement and participation of regional trauma programs in setting provincial priorities through Trauma Services BC’s council. In addition to the council, it oversees working groups like provincial performance improvement and patient safety committee, and specialist services committee to advance trauma management and monitor provincial performance through the registry.

In consultation with the council and its partners, Trauma Services BC developed a three-year strategic plan in 2014 which determined its operational focus. This consensus-based plan aligns with Ministry of Health, and provincial and regional health system priorities to further consolidate a comprehensive and accountable provincial trauma system for BC.
Trauma Services BC council

The Trauma Services BC council includes members from BC Emergency Health Services (BCEHS) and the six regional health authorities who collaboratively provide organized and coordinated trauma care for patients with major trauma injury across BC. The objectives of the council include:

• Strategic planning to assure optimal performance of BC’s trauma system.
• Implementation of system-level performance evaluation strategy.
• Implementation of an effective, secure and sustainable information management plan to support Trauma Services BC.
• Overseeing the development and implementation of an effective, secure and sustainable inter-agency quality review process for trauma care in BC.
• Engaging and supporting BC’s regional health authorities in the design and delivery of effective and efficient trauma care and injury management.
• Overseeing and supporting the implementation of a system of trauma centre designation, evaluation (verification) and accreditation, incorporating province-wide participation in Accreditation Canada’s trauma distinction program.
• Engaging and supporting BC Emergency Health Services in the design and delivery of effective and efficient strategies of pre-hospital care and the inter-facility transport of trauma patients.

Roles and responsibilities outlining collaboration with regional health authority trauma leadership are articulated through yearly service agreements. This formal agreement demonstrates transparency of funds and intentional alignment with the yearly strategic initiatives achievement. Trauma Services BC also provides a stipend for trauma registry support in designated trauma centers across BC. The council remains keen to have patient representation and feedback, where appropriate and is seeking that representation presently.

“Trauma Services BC provides a venue for discussing regional trauma care using a provincial lens, allowing for solutions that have a long lasting impact locally, regionally and provincially. Trauma Services BC meetings pull leaders from different components of our trauma system together, allowing for one collective voice to work on quality improvement initiatives and problem-solve other system-related concerns/issues. The leaders at this meeting span pre-hospital, acute care, prevention, rehabilitation and emergency preparedness, etc. Trauma Services BC has assisted us in restructuring trauma registry data collection into a useable repository of injury data for BC as well as each health authority. They also provide a venue to present and discuss trauma research and education initiatives.”

– Lisa Constable, Trauma Clinical Nurse Specialist, Fraser Health
Strategic plan (2014-2016)

The provincial oversight provided by Trauma Services BC brings provincial solutions to pressing challenges in injury management and trauma care across all of BC. Through engagement with the Trauma Services BC council, a three-year strategic plan (2014-2016) was put forward. The plan articulated Trauma Services BC’s vision and defined goals, strategies and tactics based on prioritized actions. In alignment with PHSA and Ministry of Health directives, the strategic plan identified four key priority areas:

1. Stakeholder engagement: to confirm internal and external stakeholder engagement and accountability.
2. Financial stewardship: to establish a financial plan aligned with strategic priorities.
3. Communication: to develop and implement a communication strategy.
4. Information management: to develop and implement information management plan.

<table>
<thead>
<tr>
<th>Mission</th>
<th>Trauma Services BC is responsible for ensuring optimal performance of the BC trauma system</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vision</strong></td>
<td>Through effective injury care, control and prevention, British Columbians will enjoy the lowest burden of injury Care in North America</td>
</tr>
<tr>
<td><strong>PHSA Goals</strong></td>
<td><strong>Financial Value</strong></td>
</tr>
<tr>
<td></td>
<td>Ensure responsible and sustainable use of health care dollars.</td>
</tr>
<tr>
<td><strong>TSBC Strategic Priorities (Goals)</strong></td>
<td><strong>Establish a financial plan aligned with strategic priorities</strong></td>
</tr>
<tr>
<td><strong>Aligned Strategies</strong></td>
<td>Identify, secure, and transfer existing historical funds to Trauma Services BC.</td>
</tr>
<tr>
<td></td>
<td>Delineate specific funds for trauma-related activities within the Regional Health Authorities</td>
</tr>
<tr>
<td></td>
<td>Align/redeploy monies to support identified 2014/15 strategic initiatives</td>
</tr>
<tr>
<td></td>
<td>Investigate revenue sources for new monies in support of Trauma Services BC work</td>
</tr>
</tbody>
</table>

PHSA values – Patients first • Results matter • Best value • Excellence though knowledge • Open to possibilities
In addition to working closely with regional health authorities, Trauma Services BC collaborates with various provincial partners to fulfill its strategic goals.

**BC Emergency Health Services**

BC Emergency Health Services (BCEHS), a program of PHSA, provides pre-hospital emergency services and inter-facility patient transfers throughout the province. BCEHS oversees the BC Ambulance Service and the BC Patient Transfer Network. The coordinated interaction of emergency medical services and designated trauma receiving facilities located in all health regions of the province is the cornerstone of organized and effective major trauma care. While this interaction has been consolidated over decades, the relationship between BCEHS and regional trauma programs has evolved independently.

With Trauma Services BC acting as the collective voice of the regional trauma programs, there is a growing need to work collaboratively with BCEHS to enable effective inter-agency performance of a BC trauma system founded on shared performance objectives and operational goals. BCEHS representation on our council is moving us closer to that shared goal.

**BC Coroners Service**

The BC Coroners Service is responsible for the investigation of all unnatural, sudden and unexpected, unexplained or unattended deaths. It advances recommendations to improve public safety and prevent death. The BC Coroners Service was formally engaged to explore partnership opportunities with Trauma Services BC. A need for collaboration on the description and analysis of death due to injury occurring annually in BC was identified, with particular interest in quantifying and better understanding injury. The BC Coroners Service sits as an ad hoc member of the Trauma Services BC council. Trauma Services BC and the BC Coroners Service will work together on annual death reviews for trauma occurring in BC. An information sharing agreement has been developed but is being modified to reflect this broader working relationship formally.

**Health Emergency Management BC**

Health Emergency Management BC (HEMBC) is a program of PHSA that provides emergency management leadership and support to BC’s health authorities. Working with HEMBC, Trauma Services BC is keen to establish formal partnership to enable robust collaboration between trauma programs and the provincial disaster preparedness program. An HEMBC representative sits on the Trauma Services BC council and there have been preliminary agreements to build stronger inter-organizational linkages for improved information sharing and more integrated operational planning. Disaster preparedness planning and inclusive debrief procedures for mass casualty and mass gathering events in BC were identified as priorities.

**BC Injury Prevention Policy Advisory Council**

The BC Injury Prevention Policy Advisory Council brings together key partners in injury management and prevention in a duly constituted committee reporting to the Executive Director, Healthy Living Branch, Population and Public Health, BC Ministry of Health. Trauma Services BC’s medical director sits as a full voting member of the BC Injury Prevention Policy Advisory Council which was created in 2014 to advise the BC Ministry of Health on policy matters relevant to injury prevention.
The British Columbia Trauma Registry (BCTR) contains data abstracted and coding from medical records of those injured by an external cause (traumatic injury) and admitted to hospital for moderate to severe injuries (ISS > 9). *
The BC Trauma Registry is responsible for the collection and management of clinical data on patients admitted to the 11 designated trauma centres in BC. BC’s Provincial Burn Registry also operates under the auspices of the BC Trauma Registry with two participating sites: Vancouver General Hospital and BC Children’s Hospital.

The BC Trauma Registry’s primary purpose is to support improvement in the quality of care for BC trauma patients and to reflect and facilitate system-level performance improvement.

The BC Trauma Registry provides comprehensive clinical data on acutely injured BC trauma patients not provided in its entirety by another data source. This includes patients that are admitted to a hospital within 21 days of injury resulting from selected external causes. Using the injury severity score (ISS), to index and classify injury severity, BC Trauma Registry monitors patients with an ISS score of nine or higher and all admitted pediatric patients regardless of ISS. The registry also includes all deaths in hospital, all patients who meet trauma team activation criteria and most transferred trauma patients.

BC Trauma Registry analysts are present in all 11 trauma designated facilities. Each participating hospital has one (or more) health information registrars who are responsible for coding and abstracting trauma information as per provincial standards. Data from the sites is transferred to a central registry, which contains all registry records from participating facilities. To date, the provincial trauma comprehensive data set contains over 190,000 patient records. A complete list of the inclusion and exclusion criteria for the comprehensive data set is available in Appendix 1.

“The BC Trauma Registry is a valuable resource in providing guidance, education and support for our local and regional data collection. Its leadership enables us to conduct quality assurance reviews and engage in evidence-based decision-making as well as program planning by providing a deeper understanding of the overall performance of our trauma system.”

– Jordan Oliver, Regional Manager, Northern Trauma Program

While hockey hits have been getting a lot of attention in Canada recently, skiing and snowboarding injuries are more than twice as common, according to new data released by the Canadian Institute for Health Information.
The BC Trauma Registry’s continuous data quality improvement initiatives provide frequent feedback on data quality to our sites and help us target provincial education. The standard measures of data quality are:

- **Data validity**: a measure of data quality that indicates if the data makes logical sense (that is, the admission date must always be prior to the discharge date). Data Validity for 2015 in the comprehensive data set is 90% of all cases have no data validity errors.

- **Data accuracy**: a measure which details how well the data represents what is on the patient chart. Data accuracy for 2015/16 is 98 per cent for administrative data and 88 per cent for clinical diagnoses.

- **Data completeness**: a measure of the availability of data. Depending on the type of data, data completeness varies between 60 to 100 per cent.

- **Timeliness**: a measure that data is entered within an appropriate timeframe. Currently the BC Trauma Registry data is entered approximately nine months after the patient is discharged from hospital.
The BC Trauma Registry reviews and amends its annual service contracts with health authorities to promote transparency and operational accountability with its partners in maintaining trauma data across the province. The BC Trauma Registry funds approximately 15 full-time employees (mostly health records administrators) to abstract and code comprehensive data set data into the registry and assist in provincial reporting.

The registry analyses information that resides within its database and partners with many organizations and departments to provide response to trauma related queries on performance and quality. In 2015/16, the registry received 10 research requests and over 50 aggregate requests. Some key highlights include:

- Providing reporting, analysis, data and information to support regional health authorities.
- Collaborating with BC Emergency Health Services (BCEHS) to analyse and better understand trauma system performance and BCEHS’s integral role in the patient care journey.
- Collaboration with the Rick Hansen Institute to support research on spinal cord injuries.
- Supporting a national research project in understanding pediatric trauma care by providing BC Children’s Hospital data to a national group.
- Collaboration with Cardiac Services BC to share learnings on privacy, information sharing plans and data management topics.
Key achievements

Increasing efficiencies

Based on findings from a 2014 assessment of performance and resourcing at the BC Trauma Registry’s 11 sites, Trauma Services BC has invested significantly in the BC Trauma Registry’s infrastructure to ensure sustainability and productivity of the registry’s capacity to support evidence-based decision making. As a result, the BC Trauma Registry split its data set into a comprehensive data set which records moderate to severe trauma-related hospitalizations and a minimum data set which records all trauma-related hospitalizations in BC via the existing discharge abstract database. In May 2015, the Trauma Services BC council agreed to utilize the minimum data set to collect the information required for minor injury which resulted in reducing the workload on staff by 30 per cent and allowing the registry to improve the BC Trauma Registry’s concurrency.

Improving outputs

A key strategic goal and historical need for the BC Trauma Registry has been to better analyze its data to provide better reporting on patient outcomes and to support evidence-based decision-making for better trauma management. Considerable investment was directed towards building a reporting tool to support BC Trauma Registry stakeholders in making informed operational decisions using relevant data that is easily accessible, supports decision making and requires far fewer resources to produce. To build this tool, the registry combined an innovative set of available software tools that enabled the generation of interactive analytical reports to a wide audience at a very minimal cost compared to existing alternatives.

Various departments within PHSA and other health authorities have asked the provincial BC Trauma Registry office for a demonstration of its reporting engine. Leveraging this tool, the BC Trauma Registry performed considerable data manipulation and investigation to provide brand-new Accreditation Canada indicators to support both trauma distinction accreditation for health authorities. The indicators, measuring both system and site performance, include:

- Field triage
- Time to rehabilitation care
- Compliance to trauma team activation criteria
- Emergency department length of stay
- Acute care length of stay
- Mortality rate
- Complication rate
- Compliance of emergency health services form in the patient chart
- Time to definitive care
- Venous Thrombo Embolism prophylaxis compliance
- Tracheal intubation compliance.

In addition, the BC Trauma Registry also developed the following reports:

- Annual regional health authority trauma reports
- Provincial trauma data report
- Report on the status of provincial mortality reviews.

Drivers using a mobile phone are approximately four times more likely to be involved in a crash than when a driver does not use a phone. Hands-free phones are not much safer than hand-held phone sets.6
Future initiatives

The BC Trauma Registry will continue to work on data sharing agreements with BC Emergency Health Services to improve data quality of pre-hospital data in the comprehensive data set while also working to better understand the patient continuum of care (pre-hospital and hospital) for patients who have minor injuries. The registry will seek opportunities to work closely with the BC Coroners Service to better understand the epidemiology and cause of deaths in trauma-related mortality.

With the help of its biostatistician, the BC Trauma Registry will begin to analyze mortality as a basic trauma outcome to measure if the right patient is sent to the appropriate level of definitive care while also developing annual analytical plans. In 2016/17, as an extension of the analytical plans, the BC Trauma Registry plans to implement the provincial trauma performance measurement framework as a foundation for developing a provincial trauma dashboard with standardized indicators.

The BC Trauma Registry will also support national trauma work by collaborating with the Trauma Association of Canada on the changes to the national data collection system for trauma.
Top mechanisms of injury

Mechanism of injury groups injuries that require hospitalization. Some injury hospitalizations are due to minor injury whereas others require more intensive care. The most common mechanism of injury is falls, however, many falls result in minor injuries that require hospitalization (mostly in older adults). Falls and transport related mechanisms are the main causes of moderate to severe injury hospitalizations.
BC Emergency Health Services

BC Emergency Health Services (BCEHS), an agency of PHSA, has the mandate to provide provincial ambulance and emergency health services under the *Emergency and Health Services Amendment Act, 2013*. Its mandate has also been expanded to include urgent and ancillary health services, to help support the integration of paramedics in remote and rural community settings.

With over 4,300 employees province-wide, BCEHS provides the delivery, coordination and governance of out-of-hospital emergency care through the BC Ambulance Service and the BC Patient Transfer Network. An ambulance crew is dispatched to a medical call nearly every minute of every day in BC. In 2014/15, BCEHS ground ambulances responded to over 545,000 events and BCEHS air ambulances responded to more than 6,700 calls. BC Patient Transfer Network staff coordinate the transport of critical care patients across BC. Over 34,264 transfers were coordinated by the BC Patient Transfer Network in 2014/15. This includes 24/7 clinical nurse and physician oversight of transport and triage for critical transfers of the highest acuity patients.

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2014/15 Provincial trauma pre-hospital mode of transport from scene for moderate/major injury

- Fixed-wing ambulance: 0.2%
- Helicopter ambulance: 7.3%
- Land ambulance: 78.9%
- Other: 0.2%
- Private transport: 12.9%
- Unknown: 0.5%
Highlights

- Approximately 37 per cent of the population of BC live in the region and it has the highest rates of population growth serving adult, pediatric and obstetrics.
- Royal Columbian Hospital is one of three level 1 trauma centres in BC.
- Fraser Health’s unintentional injury prevention committee has regional leadership from trauma network, emergency network and public health with project initiatives for 2015 focused on concussion awareness and community capacity building.
- Abbotsford Regional Hospital & Cancer Centre and Royal Columbian Hospital have a 24/7 dedicated clinical trauma service.
- Fraser Health has trauma outpatient clinics at Abbotsford Regional Hospital & Cancer Centre and Royal Columbian Hospital.
- Fraser Health trauma network provides grand rounds for medical education regionally and provincially since 2002 with high attendance from across the province.
- First annual trauma symposium hosted by Royal Columbian Hospital & Vancouver General Hospital trauma services in 2015.
2015 operational overview

• BC Trauma Registry at both Abbotsford Regional Hospital & Cancer Centre and Royal Columbian Hospital is close to concurrent.
• Preparation for Accreditation Canada’s trauma distinction program in 2016.

Future initiatives

• Achieve trauma distinction from Accreditation Canada in May 2016.
• Enhance quality improvement initiatives such as expand patient satisfaction survey, survey staff and revise website to internet.
• Expansion of trauma network human resources in areas of research, injury prevention, management and communication.
• Implementation of a screening program for alcohol, drugs, domestic violence and psychological well-being.

Distribution of injury related hospitalizations

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Injury / trauma</th>
<th>Moderate/severe</th>
<th>All (minor/moderate/severe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matsqui Sumas Abbotsford Hospital</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraser Canyon Hospital</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Queen’s Park Hospital</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mission Memorial Hospital</td>
<td>86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta Hospital</td>
<td>346</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eagle Ridge Hospital</td>
<td>347</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ridge Meadows Hospital &amp; Health Care</td>
<td>549</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chilliwack General Hospital</td>
<td>572</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peace Arch District Hospital</td>
<td>638</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Langley Memorial Hospital</td>
<td>730</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burnaby Hospital</td>
<td>1075</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abbotsford Regional Hospital</td>
<td>1141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surrey Memorial Hospital</td>
<td>1509</td>
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</tr>
<tr>
<td>Royal Columbian Hospital</td>
<td>2293</td>
<td></td>
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</tbody>
</table>
Interior Health

**Highlights**

- Interior Health, like BC in general, has varying population density, from mid-size cities to sparse rural regions. 11.2 per cent of Interior Health population is 65 years or greater. Population growth trend in 65+ is 17.6 per cent.

- Pre-hospital (BC Emergency Health Services) and Interior Health trauma continue development and updating of pre-hospital trauma triage transport guidelines.

- Rural emergency mobile simulation program acquired two permanent simulation coordinators at Kelowna General Hospital and Royal Inland Hospital (Kamloops).

- Emergency and trauma services held a bike safety clinic during National Kids Safe Week, providing education to the community on the importance of road safety and usage of proper bike helmets.

- High acuity response team for critical care patient transport.

Population: 0.73 million

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>birth–14</td>
<td>14.0%</td>
</tr>
<tr>
<td>15–24</td>
<td>11.6%</td>
</tr>
<tr>
<td>25–44</td>
<td>22.4%</td>
</tr>
<tr>
<td>45–64</td>
<td>31.0%</td>
</tr>
<tr>
<td>65+</td>
<td>21.1%</td>
</tr>
</tbody>
</table>
2015 operational overview

- Interior Health trauma numbers and the injury severity score continued to increase in 2015/16.¹²
- Elderly patient falls (from standing height) are of interest for Interior Health trauma program and will be investigated in greater detail.
- Interior Health is second highest mechanism of trauma is vehicular crashes with an increasing trend of morbidity and mortality associated with all-terrain vehicles¹³ (Standardized mortality ratio for motor vehicle collision is 1.72)¹⁴

Future initiatives

- Development of a formalized trauma program at the tertiary sites: Kelowna General Hospital and Royal Inland Hospital (Kamloops).
- Exploration of trends identified in death audits to look for contributing factors and prevention strategies.

Distribution of injury related hospitalizations

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrow Lakes Hospital</td>
<td>8</td>
</tr>
<tr>
<td>Princeton General Hospital</td>
<td>9</td>
</tr>
<tr>
<td>Lillooet District Hospital</td>
<td>17</td>
</tr>
<tr>
<td>Nicola Valley General Hospital</td>
<td>22</td>
</tr>
<tr>
<td>Queen Victoria Hospital</td>
<td>24</td>
</tr>
<tr>
<td>Dr. Helmcken Memorial Hospital</td>
<td>26</td>
</tr>
<tr>
<td>Invermere &amp; District Hospital</td>
<td>29</td>
</tr>
<tr>
<td>Golden &amp; District General Hospital</td>
<td>31</td>
</tr>
<tr>
<td>Boundary Hospital</td>
<td>32</td>
</tr>
<tr>
<td>100 Mile District General Hospital</td>
<td>37</td>
</tr>
<tr>
<td>Elk Valley Hospital</td>
<td>43</td>
</tr>
<tr>
<td>Creston Valley Hospital</td>
<td>78</td>
</tr>
<tr>
<td>South Okanagan General Hospital</td>
<td>82</td>
</tr>
<tr>
<td>Kootenay Lake District Hospital</td>
<td>83</td>
</tr>
<tr>
<td>Cariboo Memorial Hospital</td>
<td>108</td>
</tr>
<tr>
<td>Shuswap Lake General Hospital</td>
<td>252</td>
</tr>
<tr>
<td>Kootenay Boundary Regional Hospital</td>
<td>430</td>
</tr>
<tr>
<td>East Kootenay Regional Hospital</td>
<td>503</td>
</tr>
<tr>
<td>Penticton Regional Hospital</td>
<td>668</td>
</tr>
<tr>
<td>Vernon Jubilee Hospital</td>
<td>1096</td>
</tr>
<tr>
<td>Royal Inland Hospital</td>
<td>1436</td>
</tr>
<tr>
<td>Kelowna General Hospital</td>
<td>1704</td>
</tr>
</tbody>
</table>

Injury / trauma: Moderate/severe, All (minor/moderate/severe)
Island Health

**Highlights**

- Island Health trauma services is clearly defined as a regional program that ensures trauma quality and trauma care delivery in the four new community based regions.
- Island wide delivery of the P.A.R.T.Y. (Prevent Alcohol and Risk-Related Trauma in Youth) program.
- Forensic nurse examiners program is bundled with the regional trauma program.
- 6.8 per cent increase in trauma-related injuries in 2014/15 from the previous year.\(^\text{15}\)
- 23 per cent of the population is seniors, including the highest percentage of people aged 75 and older in BC.\(^\text{16}\)

Population: 78 million

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>birth – 14</td>
<td>13.2%</td>
</tr>
<tr>
<td>15 – 24</td>
<td>11.8%</td>
</tr>
<tr>
<td>25 – 44</td>
<td>23.3%</td>
</tr>
<tr>
<td>45 – 64</td>
<td>30.6%</td>
</tr>
<tr>
<td>65+</td>
<td>21.1%</td>
</tr>
</tbody>
</table>
2015 operational overview

• Continued support of the regional delivery of the trauma nursing core course and the addition of regional delivery of advanced trauma life support training for physicians.

• Executive approval secured for development of an inpatient trauma service and patient co-cohorted ward at level 2 site – Victoria General Hospital and Royal Jubilee Hospital (Victoria) (one site – two campuses of care).

• Defined date collection to support new Accreditation Canada standards that aid in trauma program enhancement.

• Trauma Simulation education continues in partnership with emergency department staff to ensure the delivery of major trauma care in Island Health.

• Hosted Mobile Medical Unit teaching/clinics and disaster training sessions during its annual deployment to Island Health.

Future initiatives

• Strengthening relationship with internal and external partners:
  – Working in collaboration with the BC Patient Transfer Network and BC Emergency Health Services to ensure trauma patients receive timely access to major trauma care.

• Transitioning to an electronic health record which includes a trauma flag allowing for real time identification of inpatient trauma patients.

• Establishing a quality governance structure that supports achieving trauma distinction from Accreditation Canada.

• Further development and strengthening of forensic nurse examiner community of practice.

Distribution of injury related hospitalizations

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Minor/Moderate</th>
<th>Moderate/Severe</th>
<th>All (minor/moderate/severe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cormorant Is. Community Health Centre</td>
<td>5</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Port McNeill &amp; District Hospital</td>
<td>14</td>
<td>125</td>
<td>139</td>
</tr>
<tr>
<td>Port Hardy Hospital</td>
<td>16</td>
<td>334</td>
<td>350</td>
</tr>
<tr>
<td>Tofino General Hospital</td>
<td>51</td>
<td>532</td>
<td>583</td>
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<tr>
<td>The Lady Minto Gulf Islands Hospital</td>
<td>125</td>
<td>398</td>
<td>523</td>
</tr>
<tr>
<td>West Coast General Hospital</td>
<td>141</td>
<td>1380</td>
<td>1521</td>
</tr>
<tr>
<td>Saanich Peninsula Hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campbell River General Hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Joseph’s General Hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cowichan District Hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nanaimo Regional General Hospital</td>
<td>754</td>
<td>1380</td>
<td>2134</td>
</tr>
<tr>
<td>Victoria Gen. &amp; Royal Jubilee Hospitals</td>
<td>715</td>
<td>125</td>
<td>840</td>
</tr>
</tbody>
</table>
Northern Health

**Highlights**

- Large area with sparse population, more than half the land mass of BC (66 per cent).
- Growth rate of 96 per cent in senior population 65+.
- Largest percentage of Aboriginal people in BC, three times more than any other BC health authority.
- Early fixed-wing activation program review is underway.
- Annualized funding of trauma program with part-time trauma medical leads and trauma coordinators placed in the Northern Interior, Northwest and Northeast health service delivery areas.
- Formation of successful Northern advanced trauma life support program (certification of nine Northern instructors and two coordinators).
- Expanded BC pre-registry in three trauma centre sites (Prince George, Terrace and Fort St. John hospitals).

**Population**

- Birth – 14: 18.4%
- 15 – 24: 14.0%
- 25 – 44: 26.3%
- 45 – 64: 28.9%
- 65+: 12.4%

Population .30 million
2015 operational overview

• Trauma leadership and support hires:
  – Two trauma coordinators (Northeast and Northwest health service delivery area).
  – Northern Interior health service delivery area trauma medical lead.
  – Trauma health records analyst.
  – Regional medical trauma lead.

• Rural trauma transfer package was created and disseminated for all trauma related transfer out of Northern Health.

• A life, limb and threatened organ agreement established in November 2010 was revised and renewed in 2015 in partnership with Vancouver Coastal Health and Alberta Health Services for transfers of northern tertiary trauma patients.

• Weekly retrospective case reviews of all admitted trauma patients utilizing provincial and national performance measures at University Hospital of Northern British Columbia, Fort St. John Hospital and Mills Memorial Hospital (Terrace).

• A feedback process was formalized and approved by the Northern Health privacy office to review and make recommendations to sending sites transferring patients to University Hospital of Northern British Columbia to improve communication with sending and receiving providers.

Future initiatives

• Approval received to begin preparation for a spring 2017 Accreditation Canada trauma distinction survey.

• Enhance relationships with the Northern Health executive team and senior leadership teams in each of the three health service delivery areas by establishing trauma advisory committees and a regular reporting structure.

• Develop a trauma dashboard (a joint venture with the University of Northern BC) is underway to identify trauma needs and trends while informing and engaging northern service providers and decision makers.

Distribution of injury related hospitalizations

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Moderate/severe</th>
<th>All (minor/moderate/severe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>McBride &amp; District Hospital</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Stuart Lake Hospital</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Mackenzie &amp; District Hospital</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Masset Hospital</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Queen Charlotte Islands Gen. Hospital</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Chetwynd General Hospital</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Burns Lake &amp; District Hospital</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Fort Nelson General Hospital</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>St. John’s Hospital</td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td>Bulkley Valley District Hospital</td>
<td>51</td>
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<tr>
<td>Wrinch Memorial Hospital</td>
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<tr>
<td>Fort St. John General Hospital</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>G.R. Baker Memorial Hospital</td>
<td>97</td>
<td>97</td>
</tr>
<tr>
<td>Kitimat General Hospital</td>
<td>102</td>
<td>102</td>
</tr>
<tr>
<td>Mills Memorial Hospital</td>
<td>128</td>
<td>128</td>
</tr>
<tr>
<td>Dawson Creek &amp; District Hospital</td>
<td>133</td>
<td>133</td>
</tr>
<tr>
<td>Prince Rupert Regional Hospital</td>
<td>164</td>
<td>164</td>
</tr>
<tr>
<td>University Hospital of Northern BC</td>
<td>203</td>
<td>203</td>
</tr>
</tbody>
</table>

| Total (injury/trauma)                  | 770             | 770                        |
Vancouver Coastal Health

**Highlights**

- Serves 25 per cent of BC’s population (residents of Vancouver, Richmond, North Shore and Coastal, Sea-to Sky, Sunshine Coast, Powell River, Bella Bella and Bella Coola).
- The Vancouver Coastal Health (VCH) trauma system scope encompasses population-level injury management.
- Vancouver General Hospital, as the level 1 adult trauma centre, provides leadership in quality program planning, academic research, education and training for BC.
- Partners in care include BC Emergency Health Services, BC Children’s Hospital, BC Women’s Hospital and Health Centre, injury prevention, rehabilitation, health emergency management services and public health.

Population 1.14 million

Population by age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>birth – 14</td>
<td>13.0%</td>
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<tr>
<td>15 – 24</td>
<td>12.9%</td>
</tr>
<tr>
<td>25 – 44</td>
<td>30.9%</td>
</tr>
<tr>
<td>45 – 64</td>
<td>28.2%</td>
</tr>
<tr>
<td>65+</td>
<td>15.0%</td>
</tr>
</tbody>
</table>
2015 Operational overview

- Regional trauma program successfully prepared for participation in Accreditation Canada trauma distinction in February 2016.
- Medical on-call availability program agreement for care and management of the pregnant major trauma patient in partnership with BC Women’s Hospital and Health Centre.
- Simulated trauma resuscitation update course for urban sites and a VCH rural trauma update course was developed and implemented.
- The implementation of screening and brief intervention referral to treatment for all trauma patients at Vancouver General Hospital.
- Established BC health authority injury prevention working group.
- Launch of VCH injury prevention communication strategy website, with the development of adult trauma clinical practice guidelines shared regionally on this site.

Future initiatives

- Implementing of recommendations garnered from achievement of Accreditation Canada trauma distinction.
- Clinical & Systems Transformation project (CST) – the design, configuration and implementation of an electronic health record across three health organizations (VCH, PHSA and Providence Health Care). This will be initially implemented in one of our level 3 trauma sites (Lions Gate Hospital) in the spring of 2017. CST will allow the ability to collect data in a more timely fashion to facilitate quality reviews.

Distribution of injury related hospitalizations

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Injury / trauma</th>
<th>Moderate/severe</th>
<th>All (minor/moderate/severe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R.W. Large Memorial Hospital</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.B.C. Health Sciences Centre Hospital</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bella Coola General Hospital</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squamish General Hospital</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powell River General Hospital</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Mary’s Hospital</td>
<td>137</td>
<td></td>
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</tr>
<tr>
<td>The Richmond Hospital</td>
<td>196</td>
<td></td>
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</tr>
<tr>
<td>St. Paul’s Hospital</td>
<td>388</td>
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</tr>
<tr>
<td>Lions Gate Hospital</td>
<td>1108</td>
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</tr>
<tr>
<td>Vancouver General Hospital</td>
<td>1438</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>2628</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PHSA–BC Children’s Hospital

Highlights

☑ BC Children’s Hospital is an agency of PHSA.
☑ Undergone two successful Trauma Association of Canada accreditation surveys and prepared for the 2015 Accreditation Canada trauma distinction survey.
☑ Provides expert pediatric trauma care for most seriously injured children in BC and the Yukon, from birth to 16 years old, which may not be available elsewhere in the province.
☑ Provides provincial leadership in pediatric trauma care for all consultation requested.
☑ 51 per cent of trauma admissions in 2014 were transfers from other facilities.

2015 operational overview

• Long standing trauma simulation program for all trauma team member competency maintenance (multi-disciplinary).
• Provincial pediatric rounds provided semi-annually.
• Pediatric advanced life support (PALS), advanced pediatric life support (APLS), pediatric military training run routinely.
• Pediatric advanced trauma simulation course (multi-disciplinary in-house simulation course in advanced pediatric trauma).
• Clinical support tools available provincially via Child Health BC website.

Future initiatives

• Implementation of any recommendations garnered from Accreditation Canada trauma distinction process.
• Contribute to the pediatric prevention strategies and research initiatives at BC Children’s Hospital.
• Influence and support pediatric care protocols, education and performance thresholds across BC.

Population by age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>birth–1</td>
<td>1.0%</td>
</tr>
<tr>
<td>1–4</td>
<td>22.0%</td>
</tr>
<tr>
<td>5–9</td>
<td>28.0%</td>
</tr>
<tr>
<td>10–14</td>
<td>28.0%</td>
</tr>
<tr>
<td>15–16</td>
<td>12.0%</td>
</tr>
</tbody>
</table>

Population .83 million

Population .83 million
### Distribution of injury related hospitalizations

<table>
<thead>
<tr>
<th>Hospital Name</th>
<th>Moderate/severe</th>
<th>All (minor/moderate/severe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.C. Children’s Hospital</td>
<td>1</td>
<td>138</td>
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<tr>
<td>Powell River General Hospital</td>
<td>1</td>
<td>408</td>
</tr>
<tr>
<td>Masset Hospital</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Queen Charlotte Islands Gen. Hospital</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>100 Mile District General Hospital</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>U.B.C. Health Sciences Centre Hospital</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lillooet District Hospital</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Burns Lake &amp; District Hospital</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>St. John’s Hospital</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Golden &amp; District General Hospital</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fort St. John General Hospital</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>St. Mary’s Hospital</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Fort Nelson General Hospital</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Bella Coola General Hospital</td>
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<td></td>
</tr>
<tr>
<td>St. Paul’s Hospital</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Kootenay Lake District Hospital</td>
<td>3</td>
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</tr>
<tr>
<td>G.R. Baker Memorial Hospital</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Shuswap Lake General Hospital</td>
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<td></td>
</tr>
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<td>Dawson Creek &amp; District Hospital</td>
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<td>Cariboo Memorial Hospital</td>
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</tr>
<tr>
<td>Vancouver General Hospital</td>
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</tr>
<tr>
<td>Prince Rupert Regional Hospital</td>
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<tr>
<td>West Coast General Hospital</td>
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<tr>
<td>Mills Memorial Hospital</td>
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<td></td>
</tr>
<tr>
<td>Delta Hospital</td>
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<td></td>
</tr>
<tr>
<td>Kitimat General Hospital</td>
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<td>Wrinch Memorial Hospital</td>
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<td>Bulkley Valley District Hospital</td>
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<td>Peace Arch District Hospital</td>
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<td>Burnaby Hospital</td>
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<td></td>
</tr>
<tr>
<td>Eagle Ridge Hospital</td>
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<td>St. Joseph’s General Hospital</td>
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<td>Campbell River General Hospital</td>
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</tr>
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<td>The Richmond Hospital</td>
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<td>Chilliwack General Hospital</td>
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<td>Kootenay Boundary Regional Hospital</td>
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<td></td>
</tr>
<tr>
<td>Ridge Meadows Hospital &amp; Health Care</td>
<td>24</td>
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</tr>
<tr>
<td>Cowichan District Hospital</td>
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<td>Penticton Regional Hospital</td>
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<tr>
<td>East Kootenay Regional Hospital</td>
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<tr>
<td>Langley Memorial Hospital</td>
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<tr>
<td>Vernon Jubilee Hospital</td>
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<tr>
<td>University Hospital of Northern BC</td>
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<td></td>
</tr>
<tr>
<td>Lions Gate Hospital</td>
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</tr>
<tr>
<td>Kelowna General Hospital</td>
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<td></td>
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<tr>
<td>Nanaimo Regional General Hospital</td>
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<td></td>
</tr>
<tr>
<td>Royal Columbian Hospital</td>
<td>88</td>
<td></td>
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<td>Surrey Memorial Hospital</td>
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<td></td>
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<tr>
<td>Royal Inland Hospital</td>
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</tr>
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<td>Abbotsford Regional Hospital</td>
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<td></td>
</tr>
<tr>
<td>Victoria Gen. &amp; Royal Jubilee Hospitals</td>
<td>140</td>
<td></td>
</tr>
</tbody>
</table>
Special initiatives
Specialist Services Committee Project

Background

Through the Doctors of BC specialist services committee, Trauma Services BC sought and received funding to convene and collaboratively direct a series of nine province-wide specialist advisory groups who provide care for complex major trauma in BC. The goal aligns with the strategic and operational priorities set out in the Ministry of Health’s Setting Priorities for the BC Health System (February 2014), which calls for supporting the health and well-being of BC citizens; delivering a system of responsive and effective health care services for patients across British Columbia; ensuring value for money. The primary objectives of the specialist advisory group are:

• Design processes, protocols and tools to optimize the timely, safe, effective, appropriate, equitable and cost-efficient delivery of specialist services across the continuum of care for selected groups of major complex trauma patients.

• Build physician and stakeholder engagement around a common purpose of improving patient outcomes across the continuum of acute care.

• Assess gaps in specialized care experienced by patients and providers.

• Generate provincial consensus around standardized clinical practice guidelines incorporating best evidence where available.

• Consolidate destination protocols for the transfer of acute complex trauma.

• Design and recommending approaches for timely repatriation in the post-acute phase.

• Define requirements for actionable data collection and performance evaluation strategies targeting appropriate and measurable outcomes.

It is expected that in the future, each specialist advisory group will be self-sustained providing specialists the opportunity to partner with Trauma Services BC in fulfilling its role in promoting the provision of coordinated, efficient, accessible and high quality care for major trauma injury throughout BC. Additionally, each specialist advisory group will be responsible for reporting performance metrics and showcasing care outcomes.
Performance monitoring & evaluation plan

“A carefully conceived and implemented strategy for system monitoring and evaluation is the cornerstone of effective performance improvement. To ensure the development of a robust performance improvement framework, Trauma Services BC opted to first clarify the organizational relationships, commitments and expectations that define our system of organized trauma care in BC. This effort remains ongoing and must progress further towards a clearer understanding of collaborative accountability before a robust performance improvement framework can be sustained.

Trauma Services BC is undertaking a staged, multi-faceted approach to the development of a whole system performance improvement program that is effective, efficient and meaningful to all stakeholders.

“Trauma Services BC helps support our trauma program by providing leadership with quality initiatives and supporting networking amongst trauma facilities at the provincial level. The BC Trauma Registry support is invaluable to the operation of trauma services in Interior Health, not only does this provincial office provide leadership and performance management for the data registrars, the initiatives the BC Trauma Registry has taken in the last year with regards to providing us a portal for immediate access to concurrent data, will allow us to formulate our goals in the future.”

– AJ Brekke, Network Director
Emergency & Trauma Services

Trauma injury accounts for 30% of all life years lost in the US. Cancer accounts for 16%. Heart disease accounts for 12%.”

Trauma Services BC
The key elements of this work to date include the following:

1. **Delineation of the scope, partners and organizational structure of BC’s existing trauma system and consensus on desired outcomes, key processes and preferred indicators that drive system performance.**

   A research program grant funded at $540,000 through the Canadian Institutes of Health Research’s Partnerships for Health System Improvement made it possible to leverage a research study to evaluate performance reporting in the BC trauma system. The Partnerships for Health System Improvement research culminated in a consensus building exercise with many of the province’s major organizations engaged in injury management in March 2015. It confirmed a strong common interest in consolidating a more closely integrated system of injury care, control and prevention for BC.

2. **Development of an information management platform to support performance improvement.**

   Under the direction of renewed BC Trauma Registry management, a comprehensive effort has been made to construct an information management platform that actively supports performance evaluation and improvement of the trauma system. An expanded registry infrastructure is being built to augment the functionality through:

   i. Hiring of skilled registry personnel (manager, analyst and biostatistician).

   ii. In-depth assessment of existing registry operations and capacity

   iii. Acquiring access to external data sets though information sharing agreements.

   iv. Technical improvements and data linkage procedures to streamline data access and reporting.

3. **Delineation of appropriate analytical methods through collaboration with experts in health services research.**

   Trauma Services BC aims to create a robust information management system designed to leverage available data sets and produce reporting that is meaningful to and actionable by decision makers. Such a system could and should serve important research questions central to trauma system and injury control, especially the validation of performance indicators.

4. **Development of a staged implementation plan for mounting a robust provincial performance improvement and patient safety program.**

   Trauma Services BC has worked through its council to develop a provincial performance improvement and patient safety program that will serve the needs of both a consolidated provincial system of trauma care, and the regional programs that constitute it. Underpinning this effort has been extensive work to confirm and obtain approval for the information sharing and confidentiality agreements required of partner agencies such as BC Emergency Health Services, the regional health authorities, and Health Emergency Management BC.

   The provincial performance improvement and patient safety committee (PIPS) will be accountable to the Trauma Services BC council to evaluate system-relevant concerns raised by stakeholders, and to generate recommendations for change where appropriate. The work of the committee will primarily focus on accounting for trauma deaths across the province through mortality review and filtering relevant cases for review at a provincial level. The PIPS work will be enabled by efficient use of linked registry data on a provincial information sharing platform.
Accreditation Canada trauma distinction program

The Trauma Association of Canada, formed in 1983, endorsed the US model of major trauma care and trauma system development in Canada by endorsing a similar system of trauma center verification. As such, Canada’s major trauma referral centers are designed on this model.

In 2009, the Trauma Association of Canada emphasized the importance of trauma systems over trauma hospitals by promoting accreditation at the regional level. In 2012, the Trauma Association of Canada partnered with Accreditation Canada to create performance standards for organized trauma care in Canada and share the responsibility for oversight with Accreditation Canada inaugurating a distinction program for trauma systems. Trauma distinction recognizes trauma systems or networks that demonstrate clinical excellence and an outstanding commitment to leadership in trauma care. Beginning in late 2015, the distinction program was made available through Accreditation Canada to all provinces. The Trauma Association of Canada guidelines form a strong foundation for the new standards which stress patient centered care. The new areas of accreditation focus on collection, monitoring and reporting of select indicator data with set performance thresholds. In addition to these indicators, rehabilitation services within the trauma system is a new focus for performance measurement. The key components of the program include:

i. **Trauma system and trauma centre standards**: distinction standards are based on the latest research and evidence related to excellence in the field.

ii. **Trauma protocols**: the distinction program uses evidence-based protocols to promote a consistent approach to care and increase effectiveness and efficiency.

iii. **Trauma indicators**: a key component is the requirement to submit data on a regular basis and meet performance thresholds where required.

iv. **Excellence and innovation**: distinction clients must demonstrate implementation of a project or initiative that aligns with best practice guidelines, utilizes the latest knowledge, and integrates evidence to enhance the quality of care.

The program includes an on-site visit every four years by expert evaluators with extensive practical experience in the trauma field.

In the upcoming year, Trauma Services BC seeks to further its understanding of how the distinction program will advance the collective vision for trauma care in BC. With the establishment of several provincial trauma offices and executive leadership across Canada, Accreditation Canada may recognize the need to develop accreditation programs with a new focus on provincial systems and national standards. With BC as the first province to undergo the trauma distinction accreditation process with two health authorities, Trauma Services BC hopes to represent the evolving opportunities, advantages and targeted patient care outcomes a provincial trauma system can influence.

If correctly installed and used, child restraints reduce deaths among infants by approximately 70% and deaths among small children by between 54% and 80%.

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Looking forward

A provincial trauma system

After nearly two decades of dedicated effort, British Columbia’s system of trauma care is at an exciting threshold. BC’s six regional health authorities served by a single provincial emergency medical system (BCEHS) are building a framework to enhance system level performance as a well-defined and integrated trauma system. Supporting this strengthened partnership TSBC will support two of its health regions application for Accreditation Canada’s Trauma Distinction program in early 2016.

System-level performance reporting

BC Trauma Registry has made some significant changes in data collection, reporting and analysis this year positioning TSBC to better define performance metrics within the trauma system. Given the data sharing agreements in place for specific agencies and organizations, TSBC will better reflect performance metrics that describe operational processes and linkages to shared outcome objectives. The continued development of the Performance Improvement and Patient Safety (PIPS) Program will help standardize and enhance quality of trauma mortality reviews across BC. The program will ensure that TSBC partners can share a table to discuss and review select trauma mortality cases including multiple agency scenarios under section 51 (privacy) and pass recommendations to better performance as a provincial system impacting our patient population.
Fiscal accountability

In seeking to assure high quality at an appropriate cost, TSBC is working to identify and enhance value in the way major trauma is managed across the province. Service agreements next year will become more reflective of the key programs and initiatives identified for 2016. These agreements will articulate indicators which HA trauma leadership will review and validate quarterly in addition to their participation in quality reviews of the trauma system. TSBC will also continue to take opportunities to seek out external funding sources that advance select approved strategic initiatives around optimizing care and performance for major trauma patients.

Communications

Given the activities, new partnerships and a higher visibility within our own PHSA structure, regularized, relevant and targeted communication is essential to keep the level of engagement in the forefront of our work.

In close collaboration with PHSA Communications, TSBC has initiated a branding exercise to assess and sharpen the relevance of its communication with its partners and stakeholders. Through this engagement TSBC will review its key messages, stakeholders and target areas to increase the profile and work of TSBC by leveraging appropriate communication channels and deliverables.

Going into the third year of TSBC’s three year strategic plan, 2016 provides an opportunity to conduct a progress review of our activities to date, specifically a retrospective look at consistent alignment of our activities with our stated plan and vision. This retrospective evaluation will allow us an opportunity to re-align with our set course, identify areas of work that have become operational and right size our initiatives.

The TSBC team is energized and ready to take on the challenges ahead as well as celebrate the successes to date.

Catherine Jones
Executive Director, Trauma Services BC

Dr. David Evans
Medical Director, Trauma Services BC
References


2. ISS is an anatomical scoring system that provides an overall score for patients with multiple injuries.

3. Skiing and Snowboarding Lead to Twice as Many Hospitalizations as Hockey. Canadian Institute for Health Information.

4. Based on ~250 data checks.

5. Based on a threshold of ISS varying by no more than one point.


7. The data in this section is generated from the BC Trauma Registry (Minimum Data Set) for the period of April 1, 2014 - March 31, 2015.

8. Ibid


11. Ibid

12. BC Trauma Registry Data 2015

13. Ibid


15. BCTR Data

16. People 2016 Data

17. BC Stats 2014. Total Pediatric population for BC by age group


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Ernest Stelzer, page 3

Dreamstime, page 4

BC Ambulance Service, page 19

BC’s Mobile Medical Unit program, page 45
Appendix 1
Inclusion/exclusion criteria for the BC Trauma Registry

The BC Trauma Registry has standardized inclusion and exclusion criteria that are used at all participating hospitals.

Inclusion of trauma patients
In order to be included in the BC Trauma Registry, the hospital visit of a trauma patient must meet the following criteria:

• Treatment is given for a trauma diagnosis at a trauma registry facility, with the cause of injury being a BC Trauma Registry included external cause.
• Admission is within 21 days (that is, less than or equal to 21 days) of sustaining the injury.

AND, one of the following criteria must be met:

• The adult patient (age greater than 15 years old) is admitted as an inpatient and the total length of stay is greater than or equal to 48 hours OR the pediatric patient (age less than or equal to 15 years old) is admitted as an inpatient regardless of length of stay.
• The patient is transferred out of the trauma registry facility for the purpose of providing trauma care, regardless of length of stay. This may include patients who are seen only in the emergency department and transferred to a higher level of care.
• The patient is transferred into the trauma registry facility and is admitted as an inpatient for the purpose of providing trauma care, regardless of length of stay.
• The patient dies in hospital. This includes all deaths due to injury, including those patients pronounced dead in the emergency department (even if no intervention is performed) and those pronounced dead after receiving any evaluation or treatment during the hospital visit.

Exclusion of trauma patients
A hospital visit should be excluded from the registry when any of the following apply:

• The cause of injury is a BC Trauma Registry excluded external cause.
• Daycare and outpatient encounters.
• Psychiatric admissions for self-inflicted injuries – admission for underlying psychiatric disorder rather than for injuries sustained.
• Falls/injuries – admission for underlying problem (seizure, syncope, general debility, weakness) rather than for injuries sustained.
• Pathological fractures.
• Cellulitis/infection/abscess arising as complications of lacerations, animal bites, etc.
• Poisonings/overdoses.
• Decompression sickness.
• Old or indeterminate fractures if a fall occurred.
• Foreign body in hollow viscus (esophagus, rectum, etc.).
• Chronic subdural/epidural hematomas – when admission date is beyond the 21-day interval from injury date.
• Isolated hip fractures from same level falls in elderly patients (according to set standard).*
• Planned readmissions less than or equal to 21 days of injury with definitive trauma treatment addressed in previous admission.
• Some readmissions.

*It is important to note that the BC Trauma Registry excludes patients who are 65 years of age or older with an isolated hip fracture due to a same level fall; therefore the figures in this report do not represent the complete number of hospitalizations due to same level falls.
Appendix 2
Data quality

General
• Transport mode is available for 98-99% of cases.
• Demographics (age, gender) are available 100% of cases.
• Incident date is available for 100% of cases.
• Mechanism and injury type are available for 100% of cases.
• Motivation is available for 99.6% of cases.
• Injury severity score is available for 99.87% of cases.
• Personal health number is available for 94% of cases.
• Incident locations are known for 91% of per cent BC Trauma Registry cases. Better documentation and availability of BC Emergency Health Services forms can help improve incident locations to aid in geospatial analyses.
• Protective devices are available for 80-90% of applicable cases.
• High speed data field (for motor vehicle collisions) is available for 85% of applicable cases.

Scene data
• Scene vitals, scene intubated, scene arrival/departure times are available for 87-90% of cases.
• The BC Emergency Health Services (BCEHS) form was complete 74% of the time (17% of the time the BCEHS form was incomplete and 9.3% of the time the BCEHS form was missing for cases involving BCEHS transport). This is a slight improvement from last fiscal where 22% of the time the BCEHS form was incomplete and 9.4% of the time the BCEHS form was missing. Missing BCEHS forms has an impact on several statistics from the scene including time to definitive care and scene vitals.

First facility
• Glasgow coma scale is available for 82% of transferred cases.
• Heart rate and length of stay are available for 89% of transferred cases.
• Arrival times are available for 99.5% of transferred cases.

Second facility
• Arrival times are available for 99.5% of transferred cases.
• Length of stay is available for 87% of transferred cases.
• Glasgow coma scale is available for 69% of transferred cases.
• Heart rate is available for 82% of transferred cases.

Accepting facility
• Arrival and discharge times are available for 100% of cases.
• Most responsible physician service is available for 100% of cases.
• Length of stay is available for 100% of cases.
• Glasgow coma scale is available for 83% of cases.
• Separation disposition is available for 100% of cases.
• Transfer to facility is available for 99% of cases transferred to another facility.

Among the most severe cycling injury admissions of the past decade (requiring admission to a special trauma centre), 78% of those hospitalized with a head injury were not wearing a helmet when their injury occurred.20
Emergency department consulting services

• A total of 9,476 emergency department consultations were recorded in the BC Trauma Registry in fiscal year 2013/14.

• Emergency department consultation called
  – The date that an emergency department consultation was called is available for 99% of emergency department consults called.*
  – The time that an emergency department consultation was called is available for only 39% of cases.

• Emergency department consultation arrived
  – The date that an emergency department consultant arrived is available for 99% of consults in the emergency department.*

  – The time that an emergency department consultant arrived is available for 62% of consults in the emergency department.

• Missing documentation of times has an impact of lapse and response time for emergency department consultations.

  – The lapse time (time from patient arrival to request (call) for emergency department consultation) for emergency department consultations is available for 39% of emergency department consultations.

  – The response time (time from request (call) to consultant arrival) is for 25% of emergency department consultations.

*The called date and arrival date can be determined using other information in a patient record. These figures do not represent the true number of call dates documented in a patient record.)
### Appendix 3

#### Trauma Services BC Council membership

**Chair/co-chair**
- Trauma Services BC executive director (PHSA): Catherine Jones
- Trauma Services BC medical director (PHSA): David Evans, MD

**Regional trauma programs**
- Fraser Health: Chris Windle, Iain MacPhail, MD
- Interior Health: Heather Wilson, MD, AJ Brekke
- Island Health: Anna Hill, Carrie Homuth, Chris Hall, MD
- Northern Health: Jordan Oliver, Patrick Rowe, MD
- Vancouver Coastal Health: Leanne Appleton, Hazel Park, MD

**Provincial tertiary trauma centres**
- BC Children's Hospital: Lisa Romein, Ash Singhal, MD
- Royal Columbian Hospital: Lisa Constable, Joe Haegert, MD
- Vancouver General Hospital: Nasira Lakha, Naisan Garraway, MD

**BC Emergency Health Services**
- BC Ambulance Service: Stephen Wheeler, MD, John Tallon MD
- BC Patient Transfer Network: Kathy Steegstra
- Health Emergency Management BC: Jim Fitzpatrick

**BC Trauma Registry**
- Manager: Jaimini Thakore
- Analyst: Scott Robinson
- Biostatistician: Recep Gezer
- Provincial coordinator: Jennifer McMillan

**Ad hoc members**
- BC Coroners Service: Kelly Barnard, MD
- BC Emergency Services Advisory Council: Garth Meckler, MD, Beth Anne Dirksen
- BC Injury Research & Prevention Unit: Ian Pike
- BC Medical Imaging Advisory Council: Ken Wong, MD
- BC Mobile Medical Unit: Peter Hennecke