EXTENDING TRAUMA SURGICAL CAPABILITIES IN RURAL BC - A PILOT PROJECT INVOLVING VANCOUVER GENERAL HOSPITAL AND QUEEN VICTORIA HOSPITAL, REVELSTOKE

JANUARY 16, 2020

Dr. Phil Dawe, FRCS, Vancouver
Dr. Vikki Haines, ESS, Revelstoke
THE MISSION

• **PART ONE:** RECOGNIZING THE TRAUMA BURDEN IN RURAL AND REMOTE CANADA. Banff 2016 (Simons) & 2018 (Haines) Presentations.

• **PART TWO:** RISING TO THE CHALLENGE – Our Approach
  • ESS Professional Development
  • Networked Care with Remote Presence Technology
    • Tele-Mentored Simulations
    • Tele-Consulting
  • Growing Forward
PART ONE: RECOGNITION
A truck driver snapped this photo as he is stuck at Three Valley Gap. Image credit: Kelly Zawyrucha
Three dead, many injured in B.C. avalanche


JEFF BASSETT

REVELSTOKE, B.C.
GLOBE AND MAIL UPDATE, THE CANADIAN PRESS
PUBLISHED MARCH 13, 2010
UPDATED MARCH 16, 2010
• Rural trauma outcomes are inferior to urban trauma outcomes
• Prolonged transport times and limited resources are existing problems that are difficult to modify
• Many surgeons and ESS practicing outside major trauma centres lack expertise in dealing with life-threatening surgical situations due to limited exposure, non-specialization

• Lack of experience and expertise has been identified as an opportunity for improvement
DEATH RATES DUE TO MVC IN BC

<table>
<thead>
<tr>
<th>HA</th>
<th>Pop.</th>
<th>Rate per 100,000</th>
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<tbody>
<tr>
<td>Northern</td>
<td>0.3M</td>
<td>25.4</td>
</tr>
<tr>
<td>Interior</td>
<td>0.7M</td>
<td>21.0</td>
</tr>
<tr>
<td>Island</td>
<td>0.7M</td>
<td>9.5</td>
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<tr>
<td>Coastal</td>
<td>1.1M</td>
<td>5.6</td>
</tr>
<tr>
<td>Fraser</td>
<td>1.5M</td>
<td>8.7</td>
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Simons et al. J Trauma 2010
<table>
<thead>
<tr>
<th>Type</th>
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<th>Route</th>
<th>Description</th>
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<tr>
<td>Major</td>
<td></td>
<td>Highway 1</td>
<td>Highway 1. Avalanche control work planned between Three Valley Avalanche Gate and Boulder Mtn Avalanche Gate for 10.6 km (6 to 16 km west of Revelstoke). Starting Tue Jan 7 at 4:00 PM PST untl Tue Jan 7 at 6:00 PM PST. Road closure planned. If weather persists the control may commence at 2:00 pm instead of 4:00 pm. Next update time Tue Jan 7 at 6:00 PM PST. Last updated Tue Jan 7 at 11:43 AM PST. (DBC-14612) [View on map]</td>
<td>2020-01-07 11:43 AM</td>
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<tr>
<td>Major</td>
<td></td>
<td>Highway 1</td>
<td>Highway 1. Travel advisory in effect between MacDonald Showshed and Lanark Showshed for 1.4 km (2 to 1 km west of West boundary of Glacier National Park). Poor visibility due to icing system power failure in the snow holes. Technicians are working to repair downed transformer on power line. Next update time Wed Jan 8 at 10:00 AM PST. Last updated Tue Jan 7 at 10:09 AM PST. (DBC-14498) [View on map]</td>
<td>2020-01-07 10:09 AM</td>
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<td>Major</td>
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<td>Highway 3</td>
<td>Highway 3. High avalanche hazard between West Avalanche Gate and East Avalanche Gate for 18.0 km (Kootenay Pass). Road closed. Alternate route available from Nelson to Creston. Hwy 3A Kootenay Lake ferry estimated travel time 2.5 hours. Estimated time of re-opening Wed Jan 8 at 6:00 PM PST. Next update time Wed Jan 8 at 12:00 PM PST. Last updated Tue Jan 7 at 11:59 AM PST. (DBC-14601) [View on map]</td>
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<td>Highway 37A</td>
<td>Highway 37A. Avalanche control work planned between Pearly Gates and Surprise Pullout/Windy Chain Up for 33.9 km (12 km east of Stewart to 13 km west of Maligne). Starting Tue Jan 7 at 1:00 PM PST untl Tue Jan 7 at 3:00 PM PST. Road closure planned. The road will be closed for 2 hours. Next update time Tue Jan 7 at 1:00 PM PST. Last updated Mon Jan 6 at 5:17 PM PST. (DBC-14591) [View on map]</td>
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<td>Major</td>
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<td>Highway 4</td>
<td>Highway 4. Construction work between Toquart Bay Rd and Nahmint FSR. Upper Taylor Main FSR (14 km east of Southern Boundary of Pacific Rim National Park). Until Sat Jan 18 at 7:00 AM PST. Road closures Jan 4-17: 1-4am 5-7am 4:50-6:30am 4-5pm 7-10am 10am-12am. No closures past 7am Jan 17. Closures 9-11am Jan 6-8 and 13-16. 9am-3pm traffic flushed top of hour excluding closures. 30min delays all other times. Next update time Sat Jan 18 at 7:00 AM PST. Last updated Sat Jan 4 at 9:56 PM PST. (DBC-11784) [View on map]</td>
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<td>Major</td>
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<td>Highway 5 Both Directions</td>
<td>Highway 5, in both directions. Avalanche control work planned between Exit 202 and Exit 228: Coquihalla Lakes Rd for 20.6 km (11 km south of Great Bear Snowshed to 9 km north of Coquihalla Summit). Starting Wed Jan 8 at 11:00 AM PST until Wed Jan 8 at 3:00 PM PST. THE ROAD WILL BE CLOSED BETWEEN HOPE AND MERRITT. Changes could occur based on weather conditions. Please prepare to use alternate routes. Next update time Wed Jan 8 at 3:00 PM PST. Last updated Mon Jan 6 at 4:50 PM PST. (DBC-14603) [View on map]</td>
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<td>Normal</td>
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<td>Allin Hwy</td>
<td>Allin Hwy. Watch for slippery sections between Discovery Ave and Yukon Border for 50.8 km. Compact snow. Last update time Wed Jan 8 at 1:00 PM PST. (DBC-14607) [View on map]</td>
<td>2020-01-07 12:35 PM</td>
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REVELSTOKE

- 2017-18 ER Visits = 6,394  CTAS 1 – 21  CTAS 2 – 325  Pop. 12 – 14,000
- No CT. 4 FPAs. 3 ESS. ER docs. OR and ER nurses.

- There are many remote communities in Canada w/o general surgeons
- There is limited exposure to traumatic injury in most surgical residencies, including FP-ESS
DEATH FOLLOWING INJURY

Figure 1–3 Causes of Trauma Death. Source: Adapted from “Trauma” by DD Trunkey in Scientific American (1983;249:31). Copyright © 1983 by Scientific American, Inc. All rights reserved.
PART TWO: RISING TO THE CHALLENGE: REDUCING RURAL INJURY DEATH

- Prevention
- Discovery and first responder actions
- Prehospital services
- Transportation options

- Rural hospital services
  - Surgical Damage Control
- Transfer and definitive care
- Overall system design

Reducing death from rural injury can only happen in the context of a healthy, functioning rural system.
PART TWO: RISING TO THE CHALLENGE – RURAL HOSPITAL SERVICES

Three pillars

• Professional Development
• On-Demand Tele-mentoring Support – Networked Care w/ RPT
• Regular In-Situ Simulation

Inter-personal relations
PROFESSIONAL DEVELOPMENT

• QVH and VGH have partnered to develop several learning opportunities for ESS physicians
  • 6 week Trauma Mini-Fellowship for ESS
  • DSTC – 2 day Definitive Surgical Trauma Care course
  • ASSET – 1 day Advanced Surgical Skills for Exposure in Trauma course

• One of the key benefits to conducting training at VGH has been the fostering of the interpersonal relationships necessary to maintain and enhance this capability
PROFESSIONAL DEVELOPMENT
THE MINI TRAUMA FELLOWSHIP FOR ESS – 6 WEEKS

- Vancouver General Hospital Trauma Service x 5 – 6 weeks
  - Fellow functions at senior resident level. Call-rota. Teaching rounds. Simulations. OR. Labs.
  - Specific pre-requisites
- Ideally includes DSTC: didactic material + cadaver and pig labs

- Regional and provincial relationship building amongst trauma care providers
  - Acknowledgement & support of regional trauma surgeons
- Rural-Urban service network strengthening
- April – May 2018 – 1st fellowship completed by Revelstoke ESS
• 2-day course, didactic + wet lab

• a course designed for surgeons who may deal with major trauma, and may not necessarily have the experience or ideal volumes for expertise

• timely and appropriate surgical intervention can improve the outcome of a severely injured patient.

• Suggest q4yearly for an ESS practice within an environment supportive of enhanced trauma care delivery, with appropriate network support in place
• Resuscitation practices

• Principles of Damage Control Surgery

• Control of extremity bleeding

• Control of junctional haemorrhage

• Control of cavitary haemorrhage – head, chest, abdomen
Improving rural trauma outcomes: A structured trauma-training program for Rural Family Physicians with Enhanced Surgical Skills - a pilot project. R. Simons, E. Joos, V. Vogt Haines, P. Dawe

Upcoming Events

TRAUMA 2020: SAVING LIVES & PREVENTING INJURIES
26 Mar 2020 • Halifax Convention Centre, Halifax Nova Scotia Canada

The annual Scientific Meeting and Conference of the Trauma Association of Canada is being held March 26-27, 2020 (pre-conference day March 25) at the brand new downtown Halifax Convention Centre in Halifax Nova Scotia Canada....

DSTC & ASSET COURSES IN MONTREAL
APRIL 14-16, 2020
14 Apr 2020 • Montreal, Quebec, Canada

5TH WORLD TRAUMA CONGRESS-
BRISBANE, AUSTRALIA
26 Oct 2020 • Brisbane Convention & Exhibition Centre, Brisbane, Australia
PROFESSIONAL DEVELOPMENT
ASSET

...Yearly for ESS?
1st ASSET for ESS Dec 3, 2019. 11 ESS participants from BC/AB/SK.
NETWORKED TRAUMA CARE WITH REMOTE PRESENCE TECHNOLOGY

On-Demand Tele-mentoring Support

Regular In-Situ Simulation

• In order to maintain both interpersonal and technologic familiarity between mentors and mentees, regular (q4-6 months) in-situ case simulations using tele-mentored support must be pursued.

• Simulation scenarios involve either trauma or acute care surgery and include resuscitation in the ED +/- operative intervention
  • Includes a VGH mentor via remote presence
  • On-site EMS, ERP, ESS, FPA, RNs, lab, xray, ward clerk
  • 2 hours on a weekday morning
• QVH is equipped with an InTouch Health™ remote presence technology (RPT) device that allows audio-visual interaction between mentor and mentees

• Mentors can log onto the InTouch Health™ app from any mobile device and provide guidance as necessary
  • all 6 VGH Trauma/ACS surgeons have oriented to the QVH In-Touch platform app and will accept direct calls for consultation during their regular on-call rota

• Regular use of the technology at both ends is necessary to avoid skill-fade
We will have conducted 4 Sims in ~ 18 months

Scenarios are co-prepared and co-facilitated by QVH and VGH, for the QVH team

Quality Initiative:
• Revelstoke CQI nurse and local project manager facilitate
• Resident research project Gen Sgx R4 w/ P. Dawe.
• Ethics approved.
• Pre and post sim evaluations by all team members
Sims involve complex trauma situations that preclude timely transfer to higher level of care due to the acuity of the patient or external factors ex: weather, time of day, highway closure

Case examples:
Open book pelvic # w/ hemorrhage, blunt abdominal injury w/ splenic lac & hemorrhage, penetrating chest wound w/ traumatic arrest
Scenarios are designed to lead to the initiation of tele-mentored support for the QVH team by the on-call VGH trauma surgeon for both resuscitation and a damage control operative intervention.

Each Sim concludes with a full debrief.

GOALS:
- regular practice of critical scenarios
- familiarity w/ RPT
- a format for feedback, improvement, change implementation
Dr. Hameed in the Revelstoke OR!
BENEFIT

- QVH personnel have noted improved confidence, comfort and performance in real trauma situations (regardless of whether tele-mentoring is involved)
- Increased familiarization of ESS/FPA/OR nurses w/ Damage Control procedures
- newly established local trauma committee to implement learnings from sims and networking
  - Equipment
  - Team roles
  - Team activation
- One real case in Revelstoke used the InTouch for on-demand tele-support so far
- Gathering interest from other BC/AB/SK ESS
- Ongoing rewarding collaborations with the VHGTrauma department
COST

• 6 week MTF – Rural Education Action Plan (REAP), Advanced Skills Training (AST) Program – funded by the BC Joint Standing Committee on Rural Issues ~ $32,000 practice support (including $2250 for preceptor stipends) + travel and accommodations

• DSTC - $1900 - personal CME

• ASSET - $1200 – personal CME

• ATLS - $1550 – personal CME

• Local Sims - ~ $3000 per sim = $9000 – 12,000/yr Rural Surgical and Obstetrical Networks (RSON) Initiative

• Onboarding VGH Surgeons w/ InTouch - ~ $900 RSON

• Local ER/Critical Care Committee – ~ $2000/yr Facilities Engagement
GROWING FORWARD

• Plan to continue VGH-QVH partnership for now (RSON funding x 3 more years)
• RPT in other rural BC communities (RSON) leads to….?
• Inclusion of FP-ESS in a program of case-based CME for trauma care to be developed by Trauma Services BC
• Participation of BC FP-ESS physicians on TSBC quality review panels, and Clinical Practice Guideline reviews
• Organic evolution of provincial networks as per geography and capacity
FUTURE OF RURAL TRAUMA CARE

• Hub in spoke model
  • Level 3/4 centres supported by Level 1/2 referral centre with professional development, tele-mentoring and simulation
  • Relationships are fostered through above

• Technology is evolving
  • Software and hardware will not be limitations
  • Broadband may be

• Compensation and Liability remain questions
  • Equivalent to consult?

• Other provinces in Canada
Thank You

Stu Iglesias
Richard Simons
Rural Coordination Centre of BC

VGH Trauma Department: Phil Dawe, Emilie Joos, David Evans, Morad Hameed, Naisan Garraway, Harvey Hawes

Trauma Services BC
Graeme Hintz
Rural Education Action Plan
Joint Standing Committee on Rural Issues

Queen Victoria Hospital team