NB Inclusive Provincial Trauma System and Field Trauma Triage Guidelines

NB Trauma Program
Programme de traumatologie du NB

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Field Trauma Triage Guidelines

1-888-790-9222

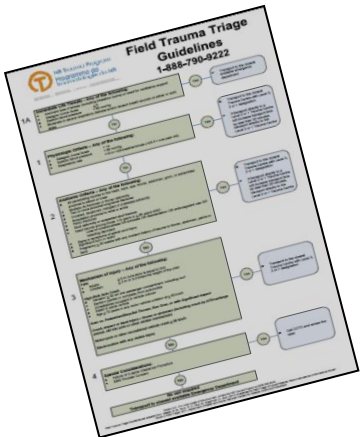
1A

Immediate Life Threats - Any of the following:

- Imminent loss of airway (including inhalation burns) or need for ventilatory support
- Glasgow Coma Scale ≤ 8
- Systolic blood pressure < 60 mmHg
- Moderate to severe respiratory distress and/or absent breath sounds on either or both sides

Yes

- Transport to the closest available emergency department



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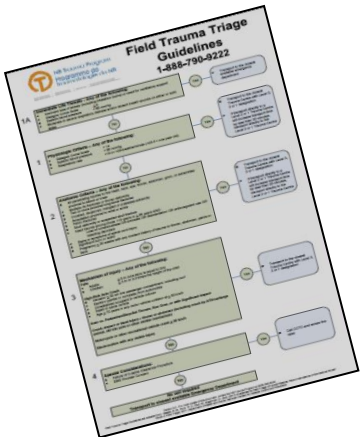
1

Physiologic Criteria – Any of the following:

- Glasgow Coma Scale < 14
- Systolic blood pressure < 90 mmHg
- Respiratory rate <10 or >29 breaths/minute (<20 if < one year old)

Yes

- Transport to the closest Trauma Centre with Level 3, 2 or 1 designation
- If transport directly to a Level 2 or 1 Trauma Centre will increase transport time by less than 20 minutes, transport directly to the Level 2 or 1 Trauma Centre



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2

Anatomic Criteria – Any of the following:

- All penetrating injuries to the head, neck, eye, chest, back, abdomen, groin, or extremities proximal to and including elbow or knee
- Multiple rib fractures or thorax deformity
- Two or more proximal long-bone fractures
- Crushed, de-gloved, mangled or pulseless extremity
- Amputation proximal to wrist or ankle
- Pelvic fractures
- Skull deformity or suspected skull fracture
- Head trauma among those <18 years or > 65 years AND loss of consciousness OR amnesia OR disorientation
- Head trauma in patient of any age with bleeding disorder or anticoagulant use
- Signs or symptoms of spinal cord injury
- Significant burn or scald
- Pregnancy ≥ 20 weeks with any incident history of trauma to chest, back, abdomen or pelvis

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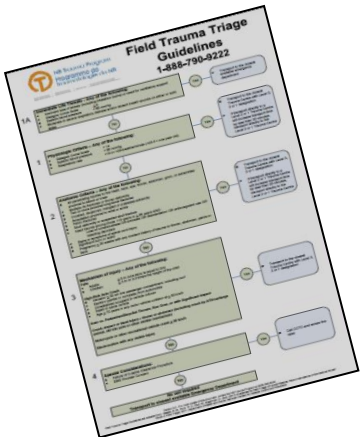

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3

Mechanism of Injury – Any of the following:

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- Adults: ≥ 5 m (one story is equal to 3m)
- Seniors (age >65): ≥ 5 steps
- Children: ≥ 3 m or 2-3 times the height of the child

High-Risk Auto Crash

- Intrusion ≥ 30 cm into passenger compartment, including roof
- Ejection (partial or complete) from automobile
- Unrestrained occupant in vehicle rollover
- Death in same vehicle
- Age ≥ 70 years in any motor vehicle collision at ≥ 80 km/h

Pedestrian/Bicyclist Thrown, Run Over, or with Significant Impact

Crush, impact or blast injury – chest, back or abdomen (including crush by ATV/car/ large animal, ski into pole or other similar mechanism)

Motorcycle or other recreational vehicle crash ≥ 30 km/h

Electrocution with any visible injury

Yes

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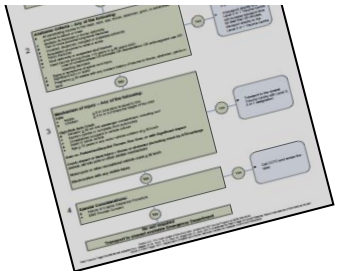

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Field Trauma Triage Guidelines

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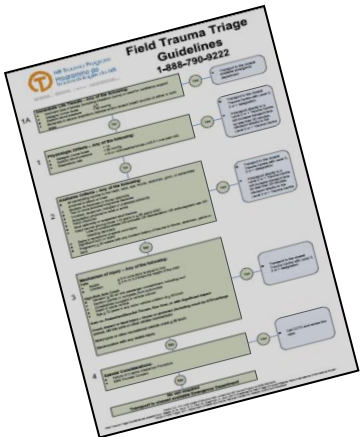
4

Special Considerations:

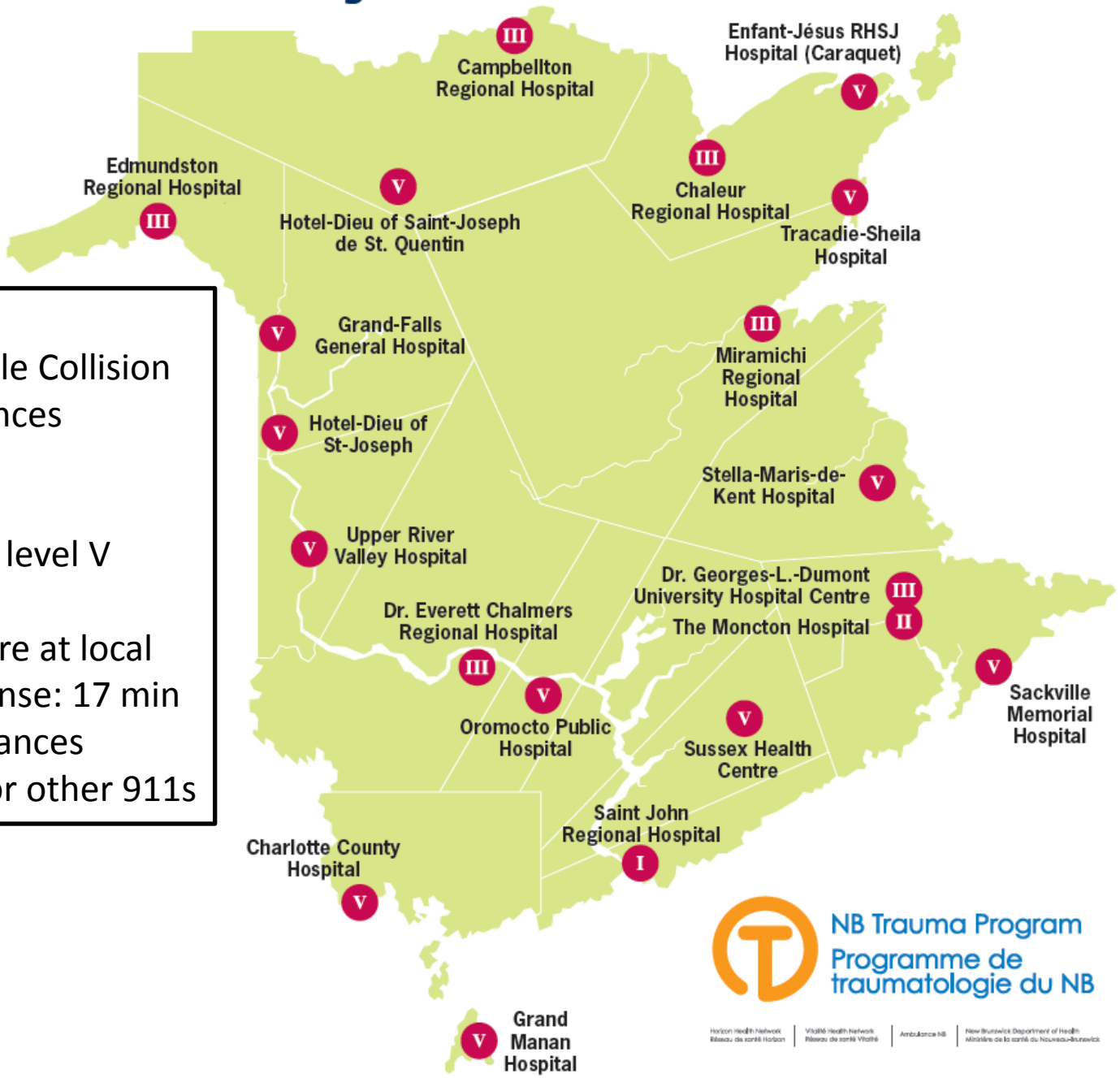
- Failure of C-spine Clearance Procedure
- EMS Provider Concern

Yes

- Call CCTC to consider transport directly to a Level I, II or III centre



Current NB Trauma Level Designations



Scenario: COMPLEX

- Rollover Motor-Vehicle Collision
- 3 Patients; 0 Ambulances available
- Time of day: 1900
- Incident 10 min from level V centre
- Unit 1 transferring care at local level V centre; response: 17 min
- 2 surrounding ambulances already dispatched for other 911s

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NB Trauma Program
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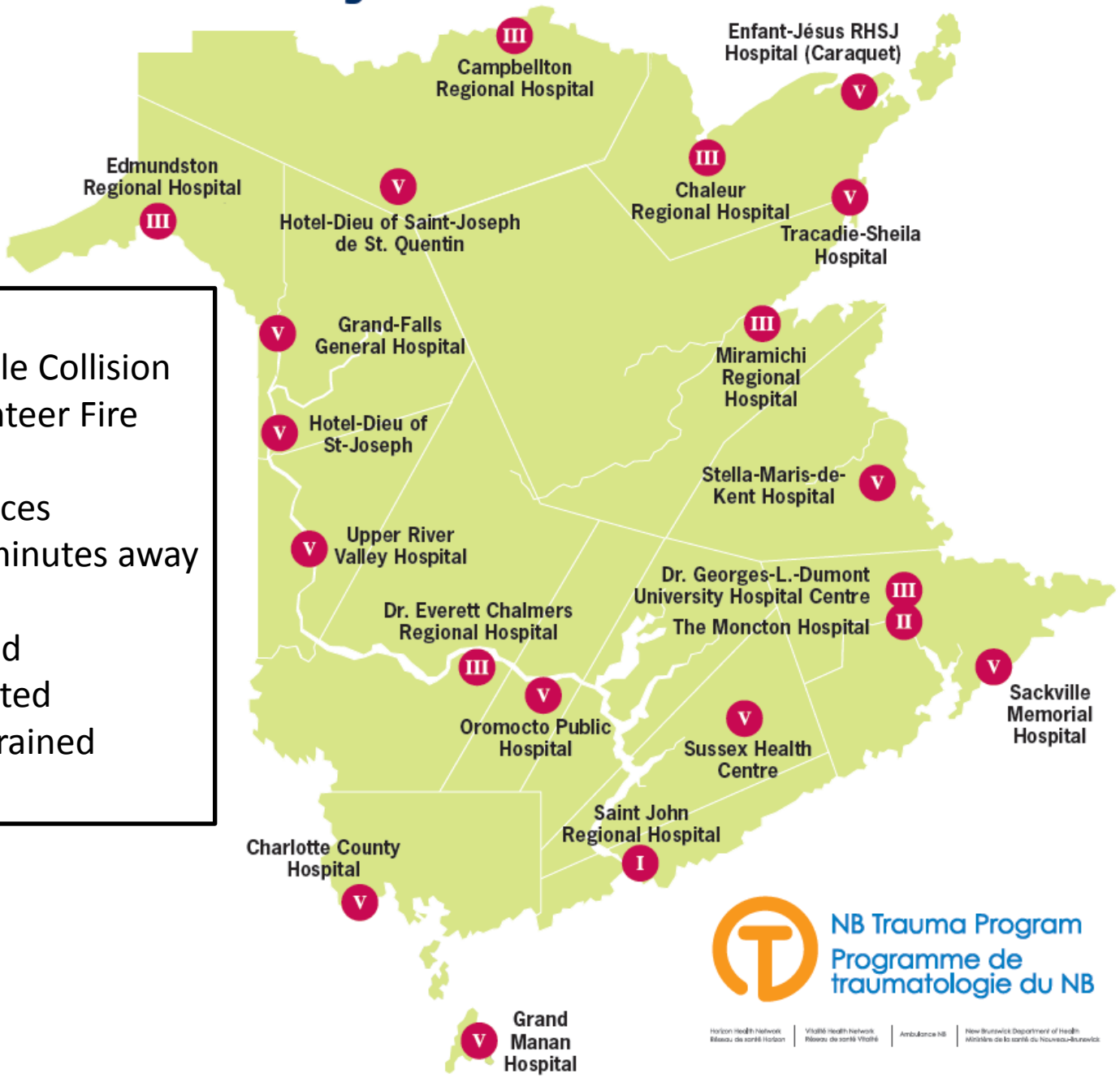
Current NB Trauma Level Designations



Scenario: **COMPLEX**

- Rollover Motor-Vehicle Collision
- Police and local volunteer Fire Dept. dispatched
- 2 additional ambulances dispatched from 45 minutes away

Scene Report:

Pt 1: 12 y/o male; ejected

Pt 2: 16 y/o female; ejected

Pt 3: 17 y/o female; restrained

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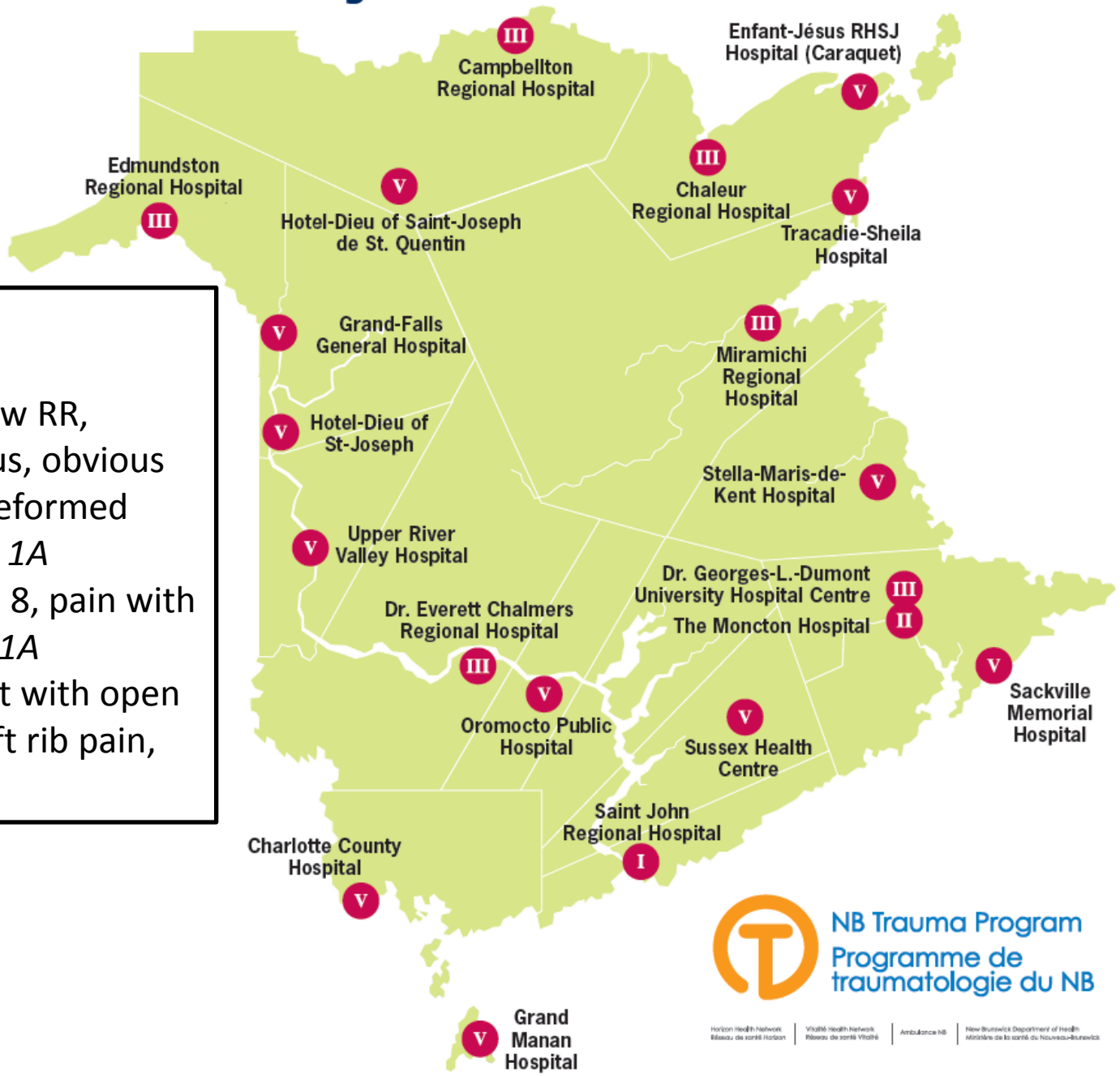

<u>Scenario</u>: COMPLEX

<u>Rapid Triage</u>:

Pt 1: 12 y/o male; shallow RR, responds painful stimulus, obvious signs of TBI, pulseless/deformed upper extremities; *FTTG 1A*

Pt 2: 16 y/o female; GCS 8, pain with c-spine palpation; *FTTG 1A*

Pt 3: 17 y/o female; alert with open distal right arm #, c/o left rib pain, stable; *FTTG 2*

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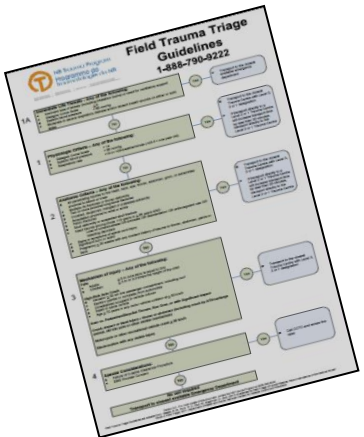

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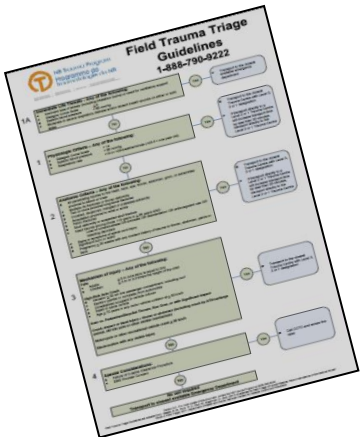
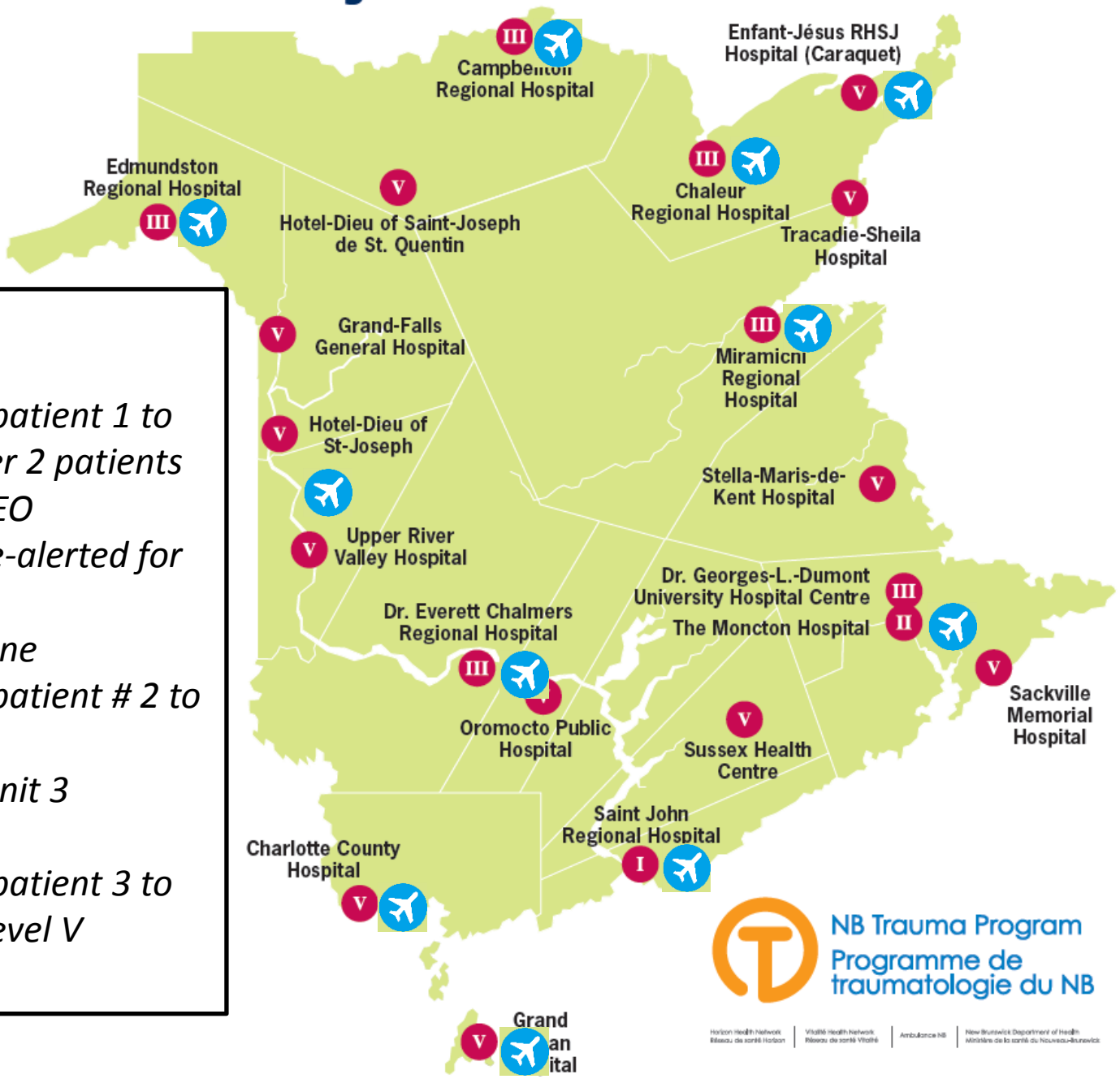


Current NB Trauma Level Designations



<u>Scenario</u>: COMPLEX

<u>Timeline</u>:

19:24 – Unit 1 transports patient 1 to closest level V centre, other 2 patients with volunteer MFR and LEO

19:34 – Air Ambulance pre-alerted for FTTG 1A

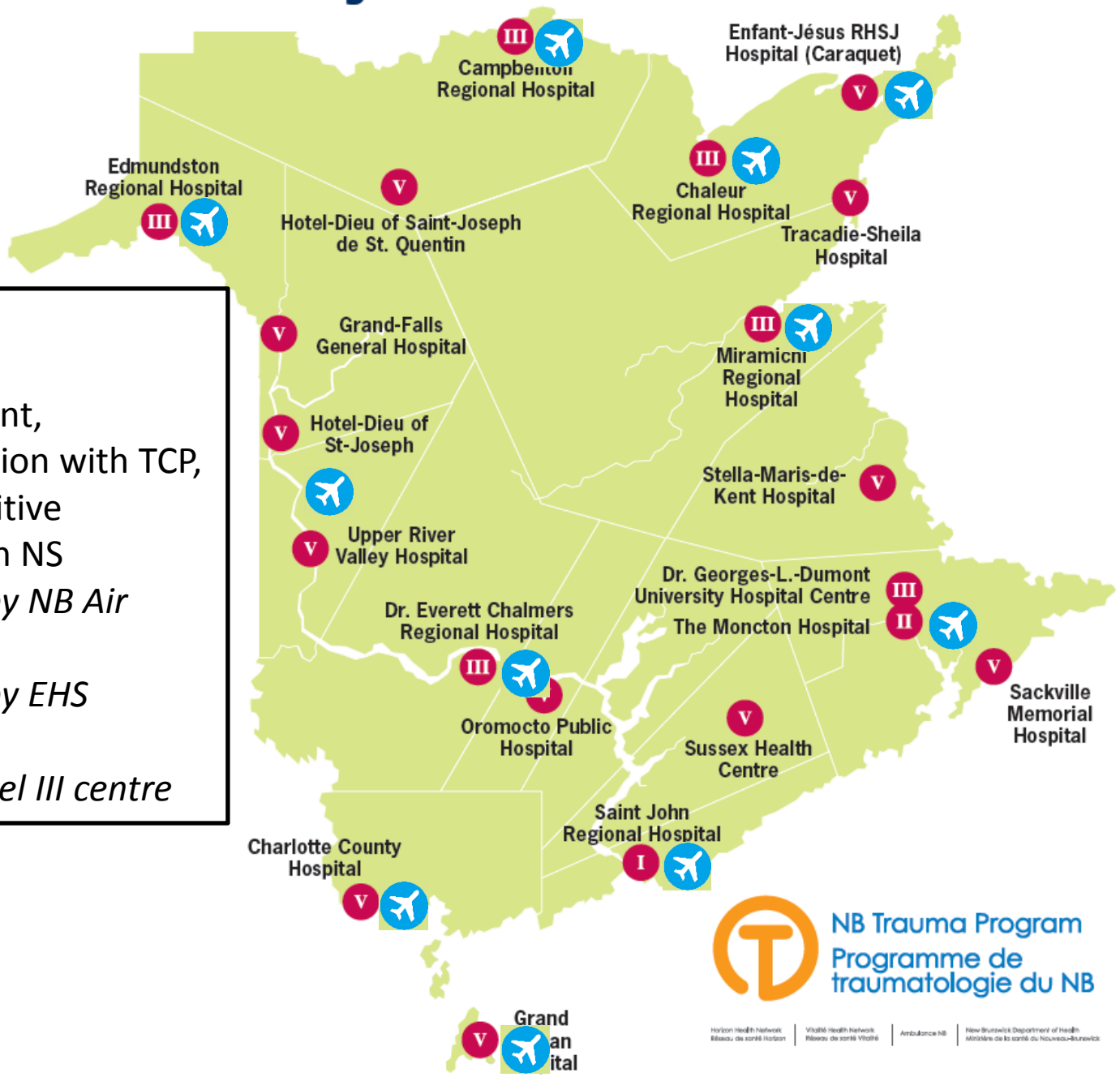
19:42 – Unit 1 back on scene

19:44 – Unit 1 transports patient # 2 to same level V centre

19:48 – Unit 2 on scene, Unit 3 cancelled

19:55 – Unit 2 transports patient 3 to level III centre bypassing level V

Current NB Trauma Level Designations



Scenario: **COMPLEX**

Conclusion:

After in hospital assessment, stabilization and consultation with TCP, transfer arranged to definitive children's trauma centre in NS

- *Patient 1 transported by NB Air Ambulance*
- *Patient 2 transported by EHS Lifeflight*
- *Patient 3 treated at level III centre*

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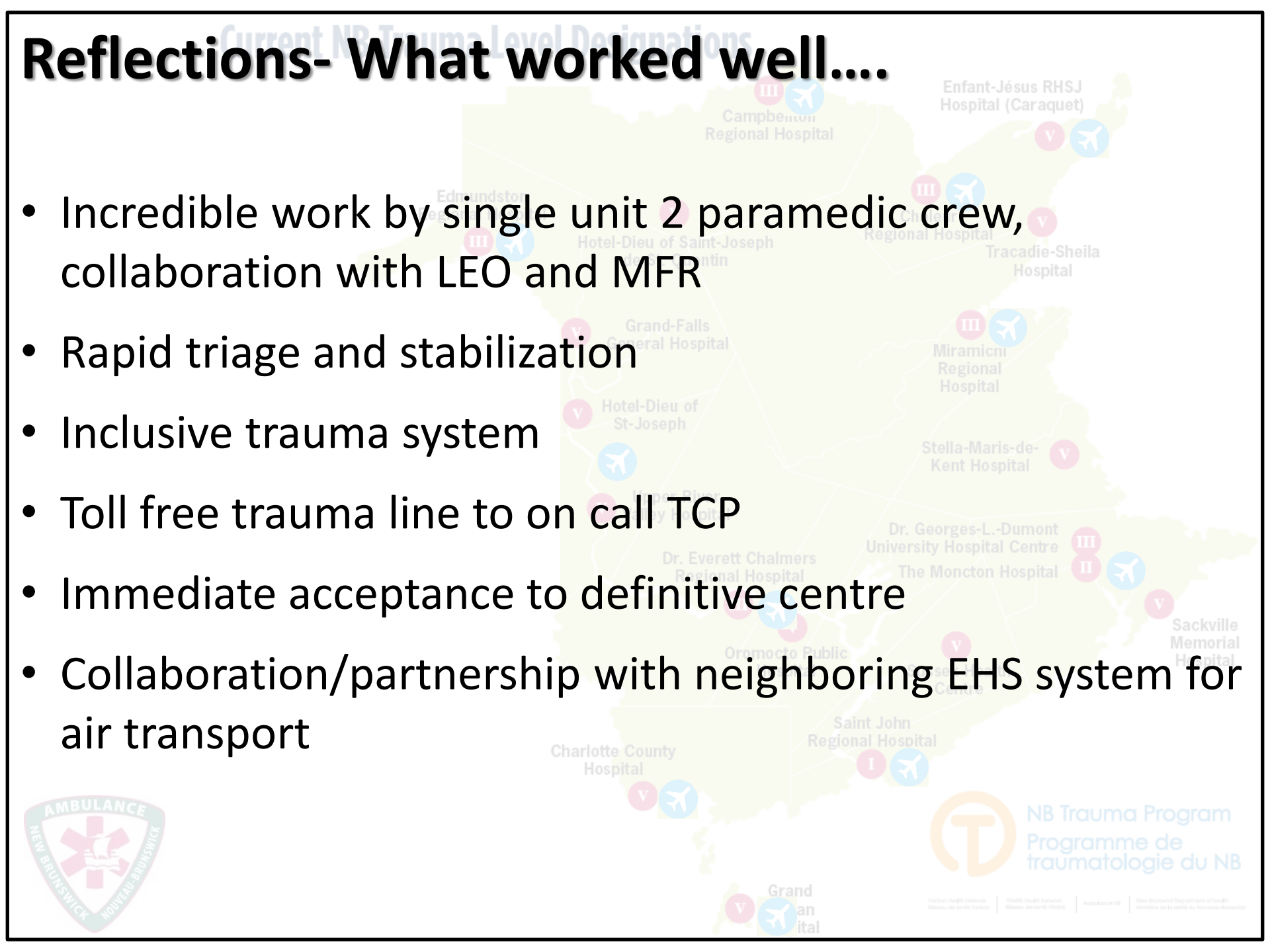
Reflections- What worked well….

- Incredible work by single unit 2 paramedic crew, collaboration with LEO and MFR
- Rapid triage and stabilization
- Inclusive trauma system
- Toll free trauma line to on call TCP
- Immediate acceptance to definitive centre
- Collaboration/partnership with neighboring EHS system for air transport

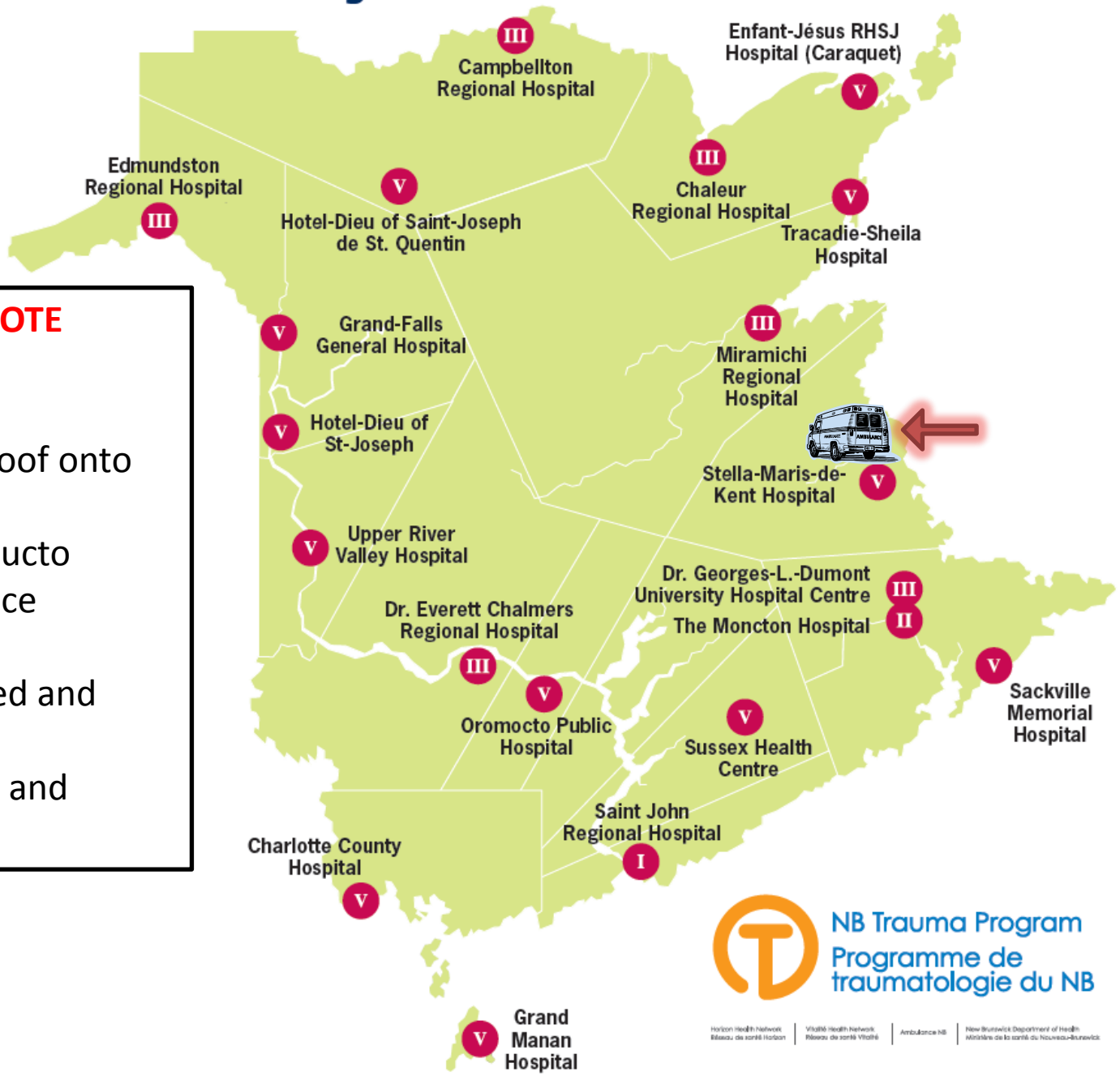


Reflections- Questions to consider

- How to revise our MCI planning for rural areas when resources are overwhelmed?
- Enhance communication with receiving facilities for incoming multiple patients
- Resource management for critical care transports
  - ✓ Single fixed wing asset
    - ❑ launch back up fixed wing
    - ❑ partner air services
    - ❑ expand ACP critical care ground transport
- Targeted trauma IPE through NBTP mobile simulation program

Complex response highlights need for continued effort for system integration of EMS/RHA and out of province quaternary services

Current NB Trauma Level Designations



Scenario: **RURAL/REMOTE**

- Male; 31 y/o
- Fall from 2nd story roof onto cement steps
- Just North of Richibucto
- 11 minute ambulance response time
- Neighbour witnessed and called 911
- Patient is conscious and breathing

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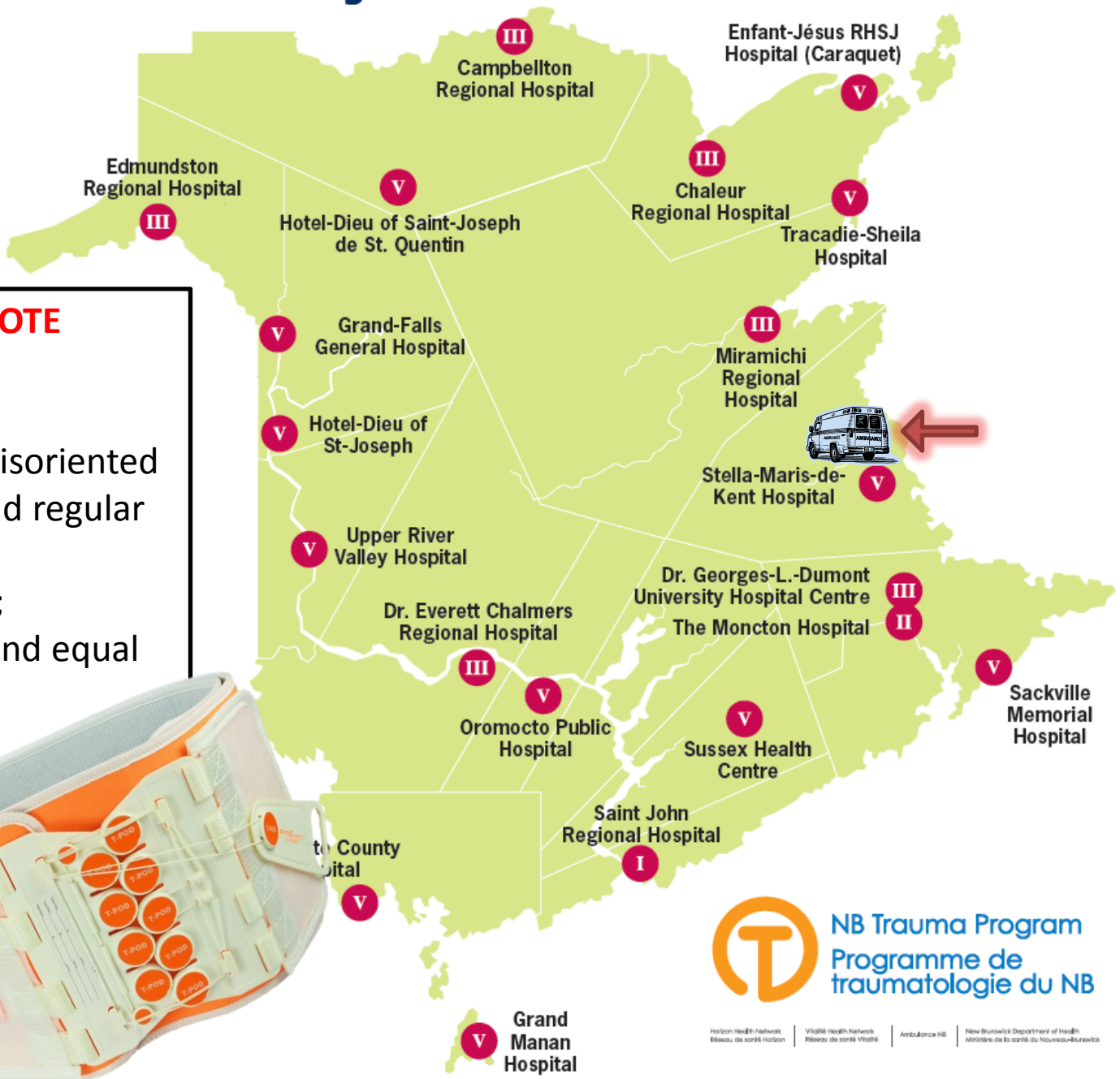
Current NB Trauma Level Designations



Scenario: **RURAL/REMOTE**

- Male; 31 y/o
- Cognitive: Alert & disoriented
- HR: 98 at carotid and regular
- BP: 88/60
- VR: 28; no dyspnea;
- Lung sounds clear and equal bilaterally
- UNSTABLE PELVIS

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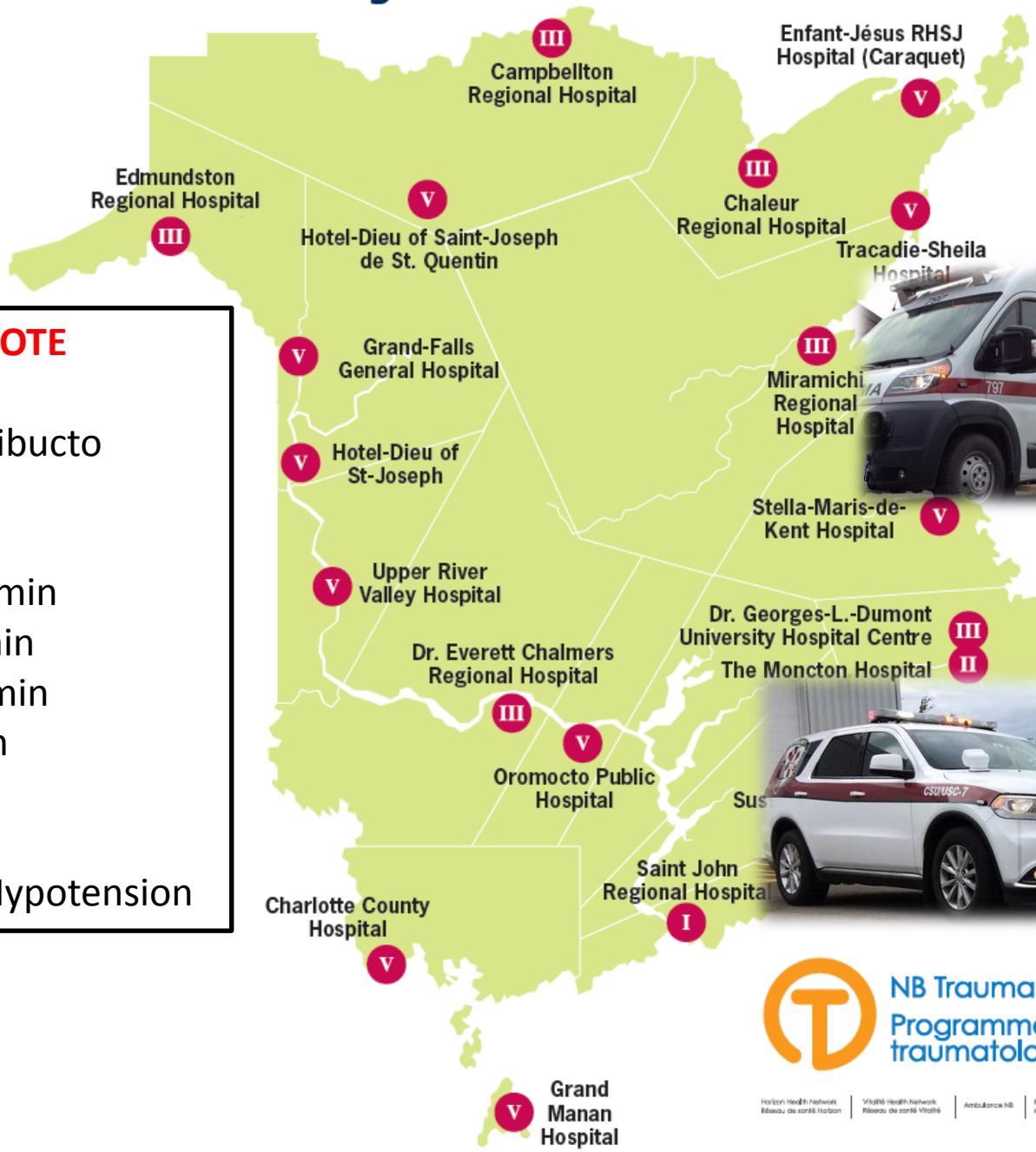

Scenario: **RURAL/REMOTE**

Location: Outside Richibucto

Destination Options:

- Stella-Maris (V): 15min
- Miramichi (III): 46min
- G. Dumont (III): 51min
- Moncton (II): 54min

FTTG:

Level 1 (Physiologic): Hypotension

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1

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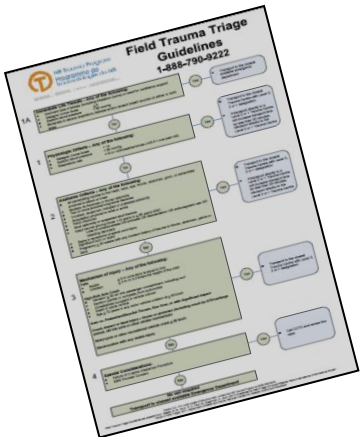
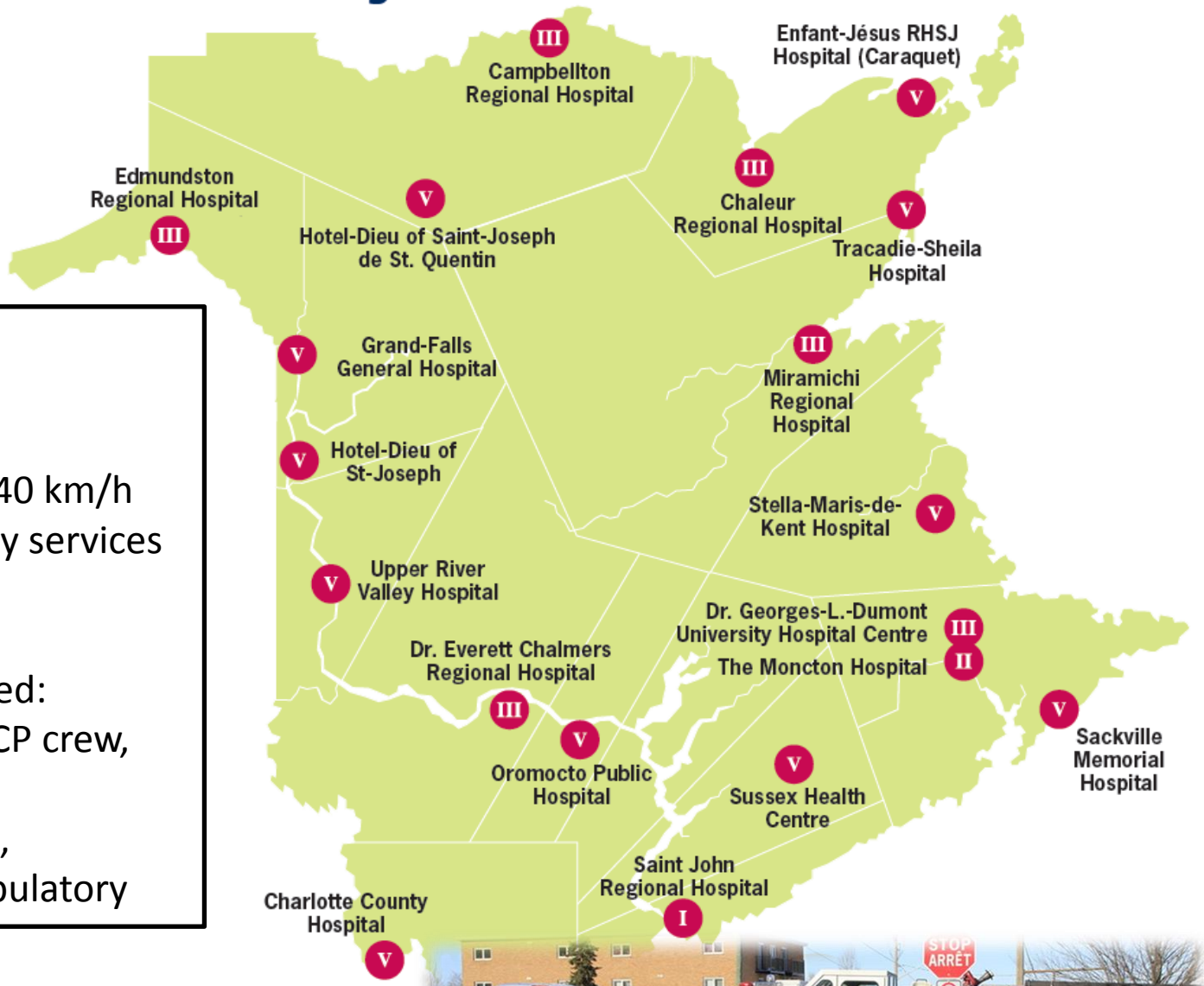


Reflections- Questions to consider

- Are rural ER staff getting early notification, and are they capitalizing on advance notice when received?
- Are level I/II/III trauma centres getting early enough notification and making use of that time when level V centres are bypassed?
- Resource management for critical care transports
  - ✓ Fixed wing Air Ambulance
  - ✓ Ground Ambulance with PCP crew
  - ✓ Hospital staff filling inter-facility care role
  - ✓ ACP
- Is there a need for enhanced inter-agency communication and exercises?

Rural/Remote trauma patients continue to benefit the most from FTTG

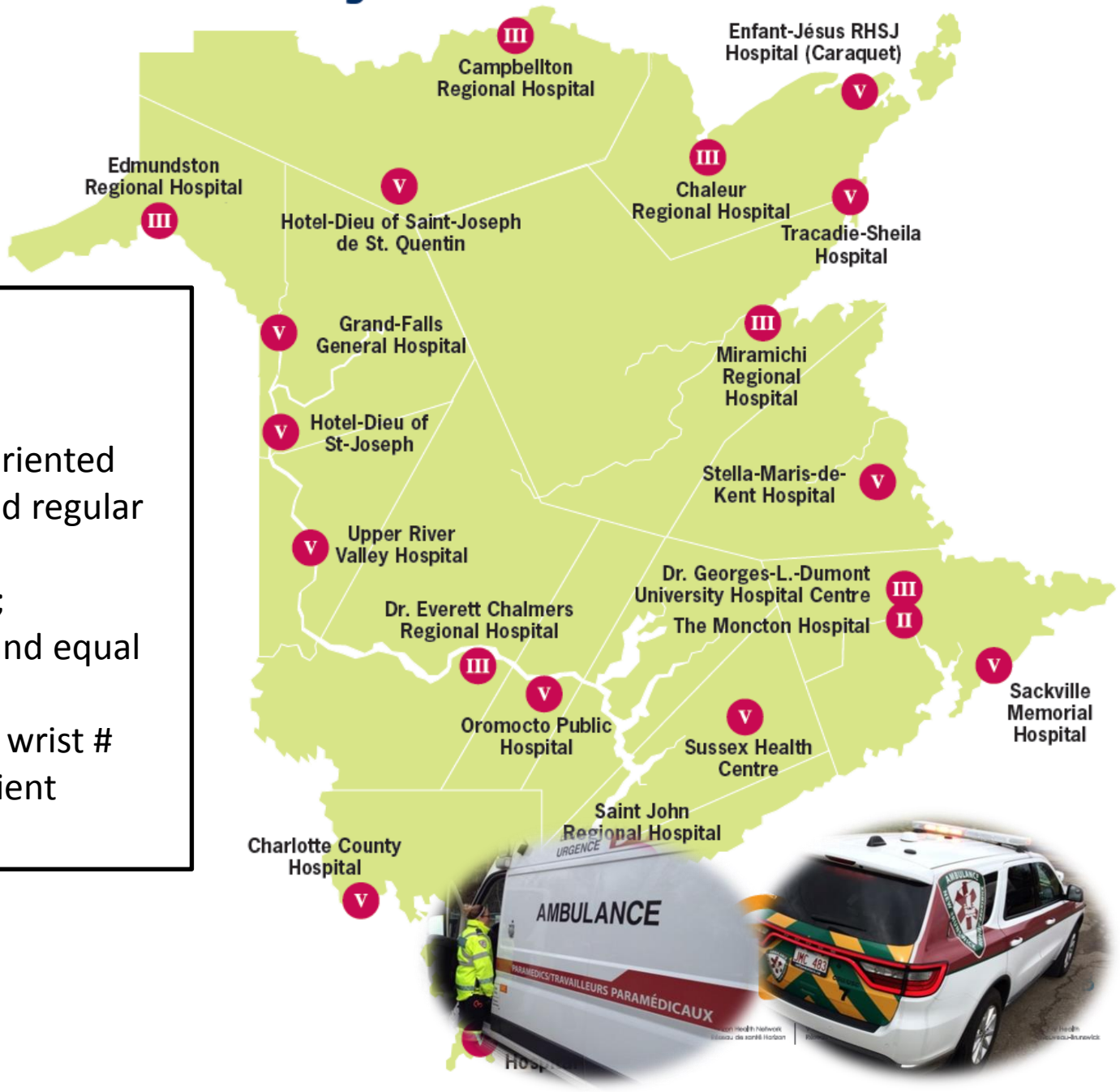
Current NB Trauma Level Designations



Scenario: **URBAN**

- Female; 45 y/o
- Car vs. Pedestrian; 40 km/h
- 3 minute emergency services response time
- Lunch hour
- Resources dispatched: Fire/MFR, Police, PCP crew, ACP support
- Patient is conscious, breathing, non-ambulatory

Current NB Trauma Level Designations



Scenario: **URBAN**

- Female; 45 y/o
- Cognitive: Alert & oriented
- HR: 105 at radial and regular
- BP: 128/70
- RR: 26; no dyspnea;
- Lung sounds clear and equal bilaterally
- Left Tib-Fib #, Right wrist #
- Bystanders saw patient thrown by car

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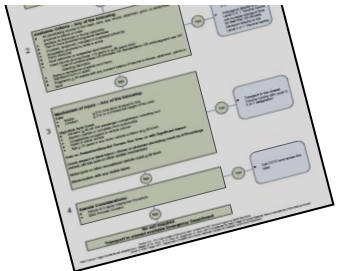
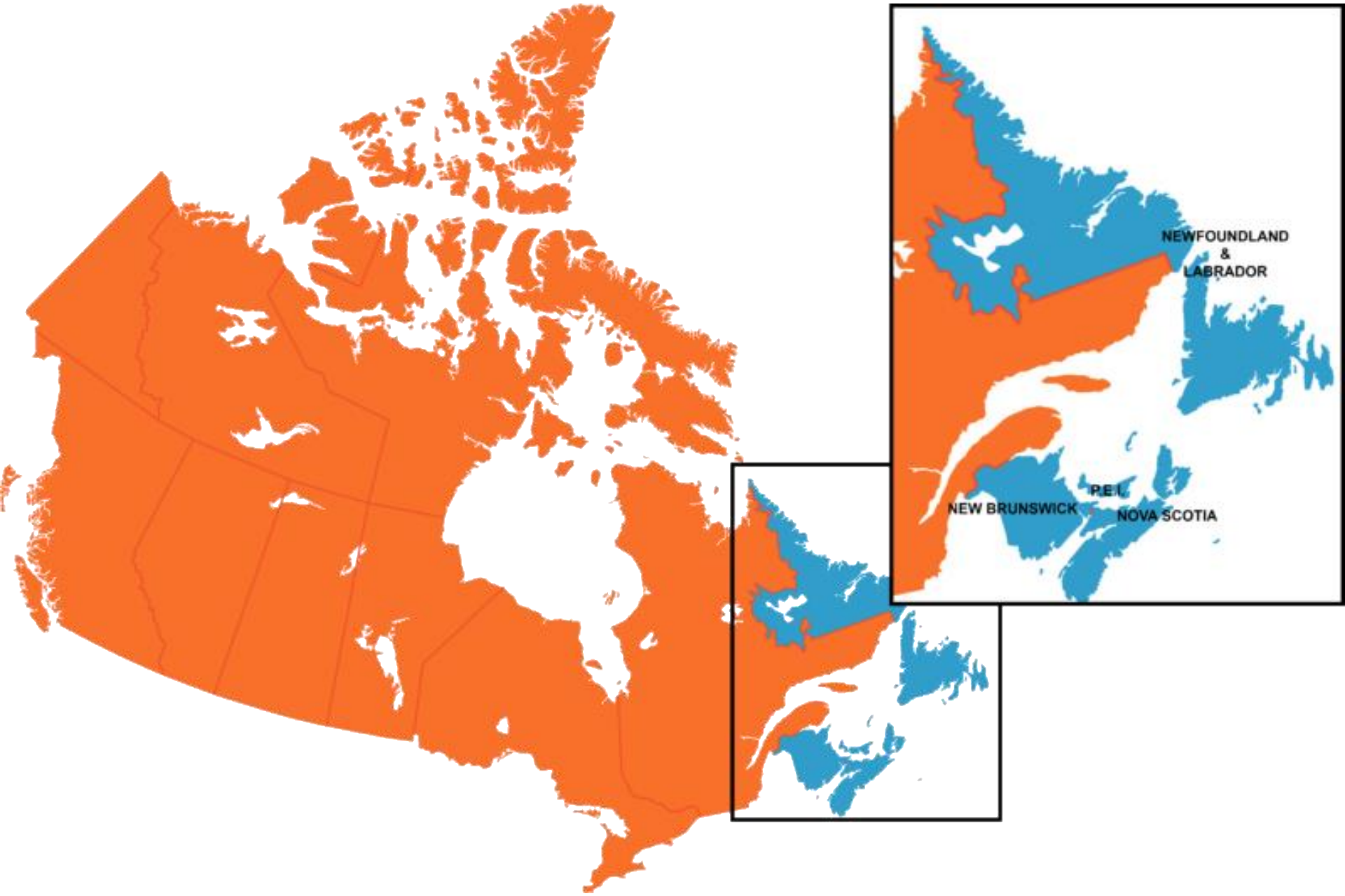


Reflections- Questions to consider

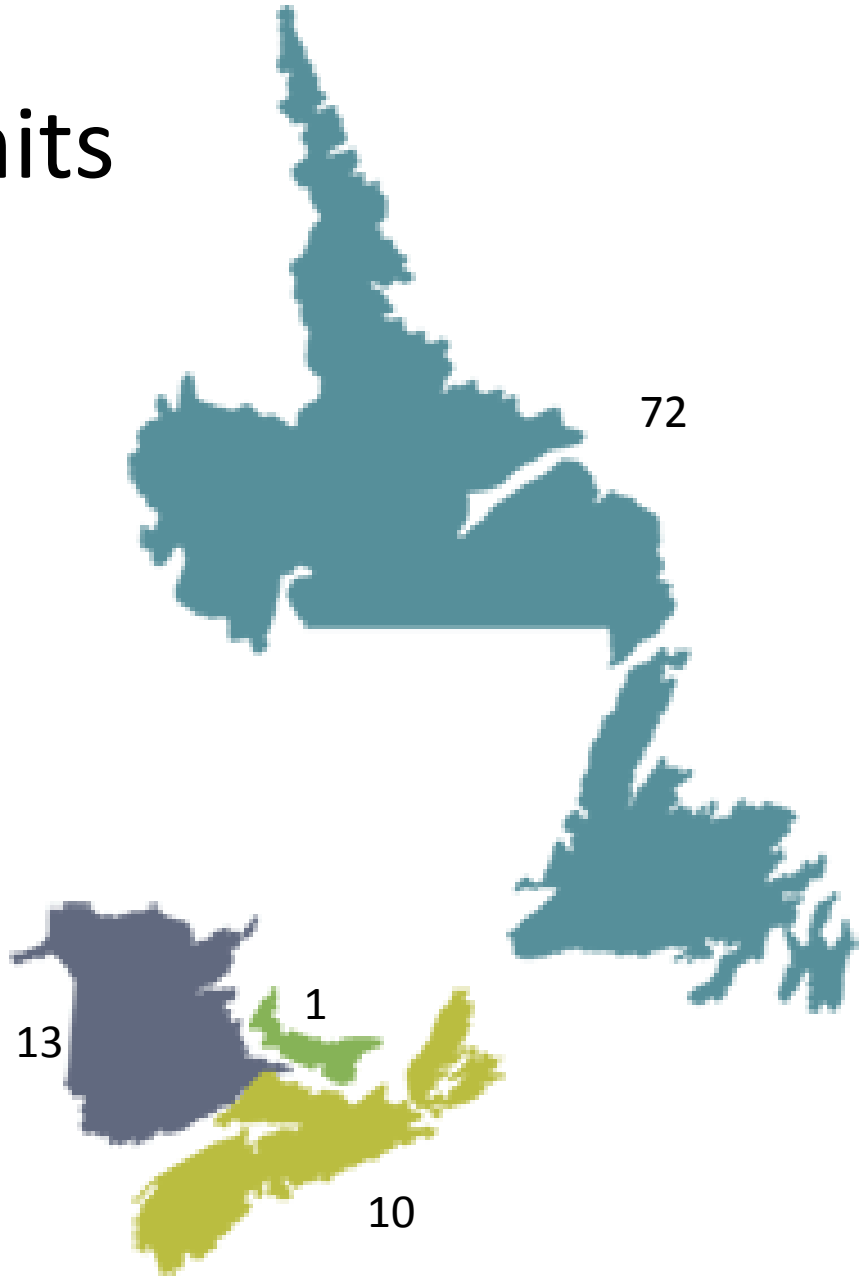
- What role does a provincial trauma system play in an urban setting?
- Are urban ER staff getting early notification, and are they capitalizing on advance notice when received?
- Resource management for critical care transports
  - ✓ Fixed wing Air Ambulance
  - ✓ Ground Ambulance with PCP crew
  - ✓ Hospital staff filling inter-facility care role
  - ✓ ACP
- Is there a need for enhanced inter-agency communication and exercises?

Urban trauma presents it's own questions of efficient resource management and timely intervention for both EMS and RHA

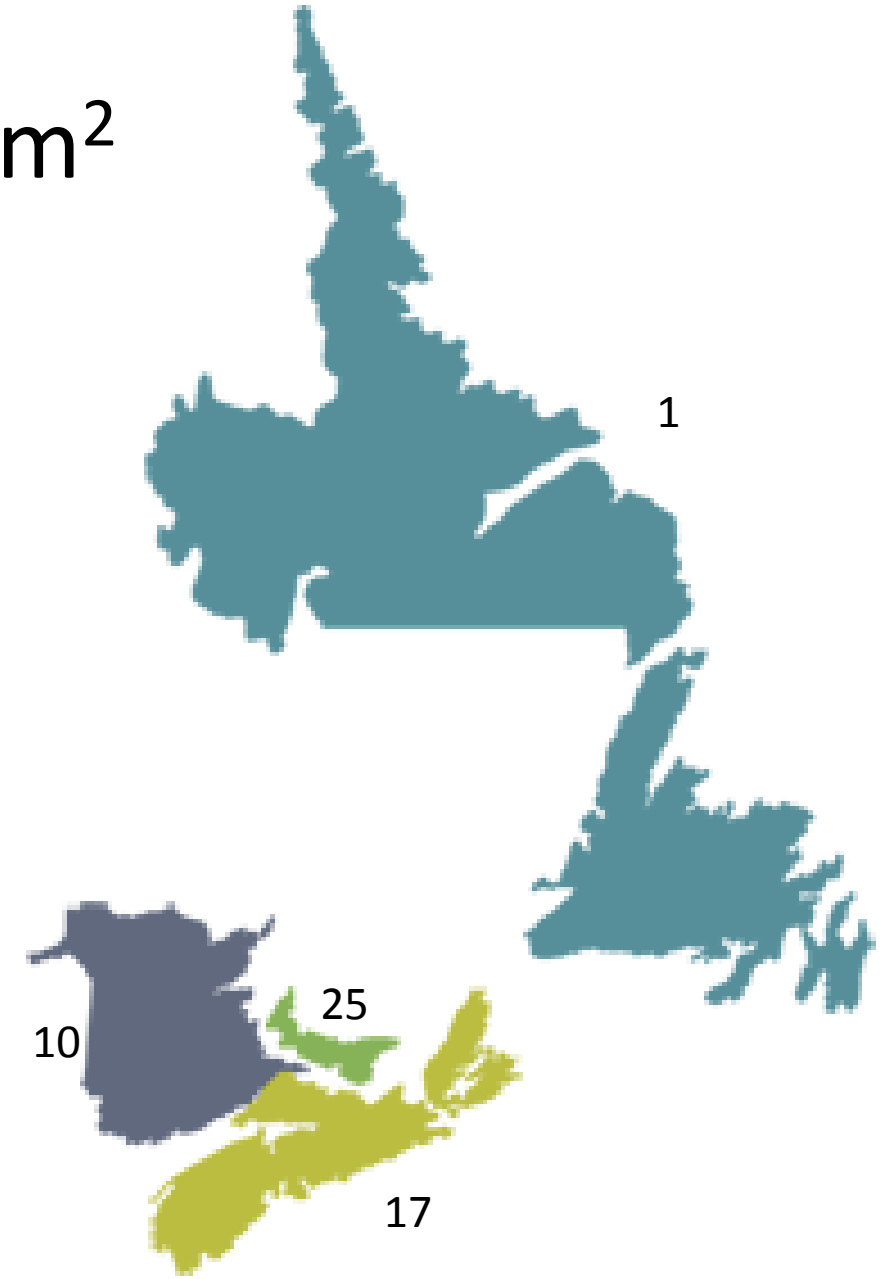
Nova Scotia Perspective

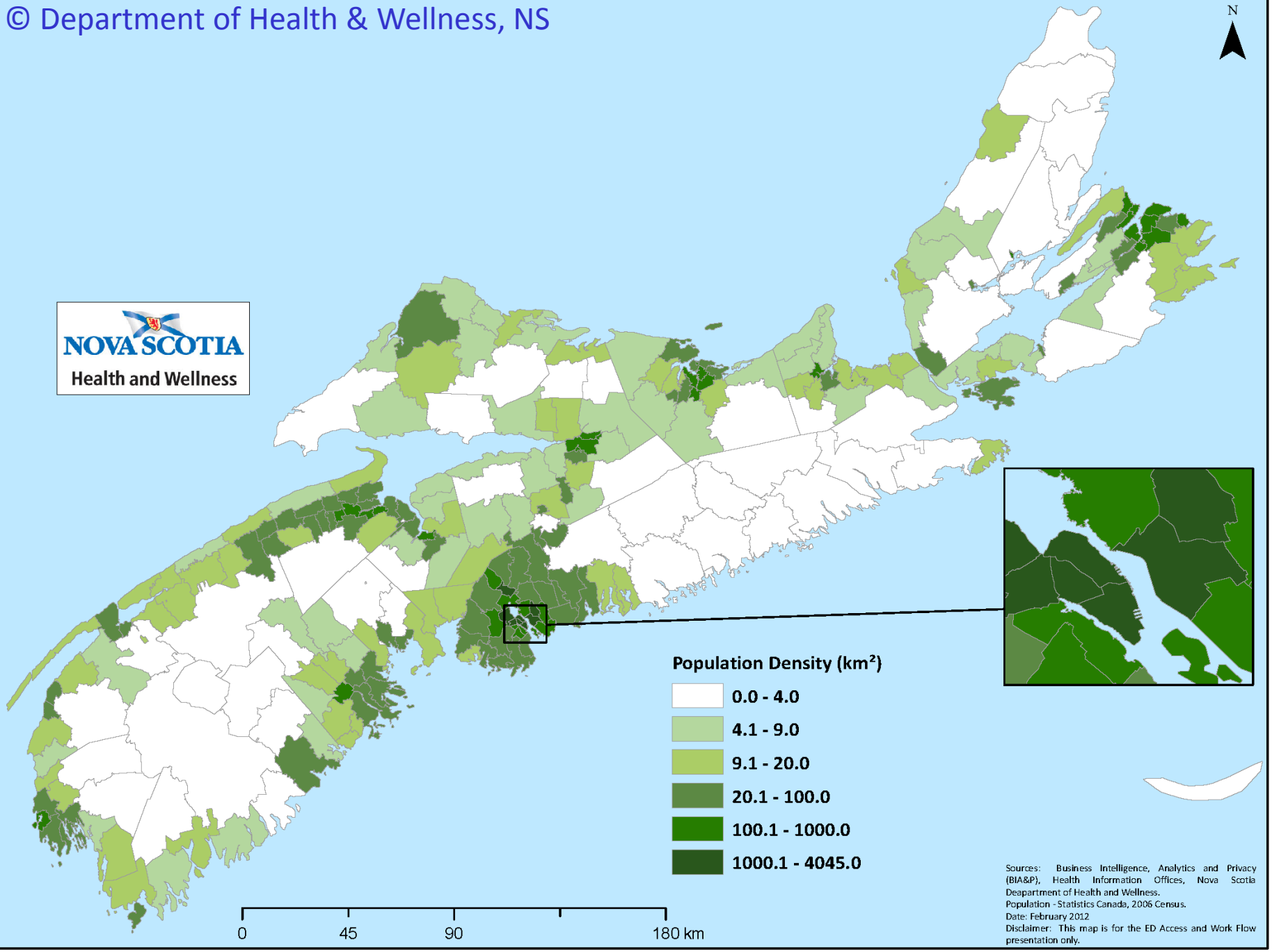

NEWFOUNDLAND
&
LABRADOR
P.E.I.
NEW BRUNSWICK
NOVA SCOTIA

Atlantic Units
Km^2



Patients/Km^2

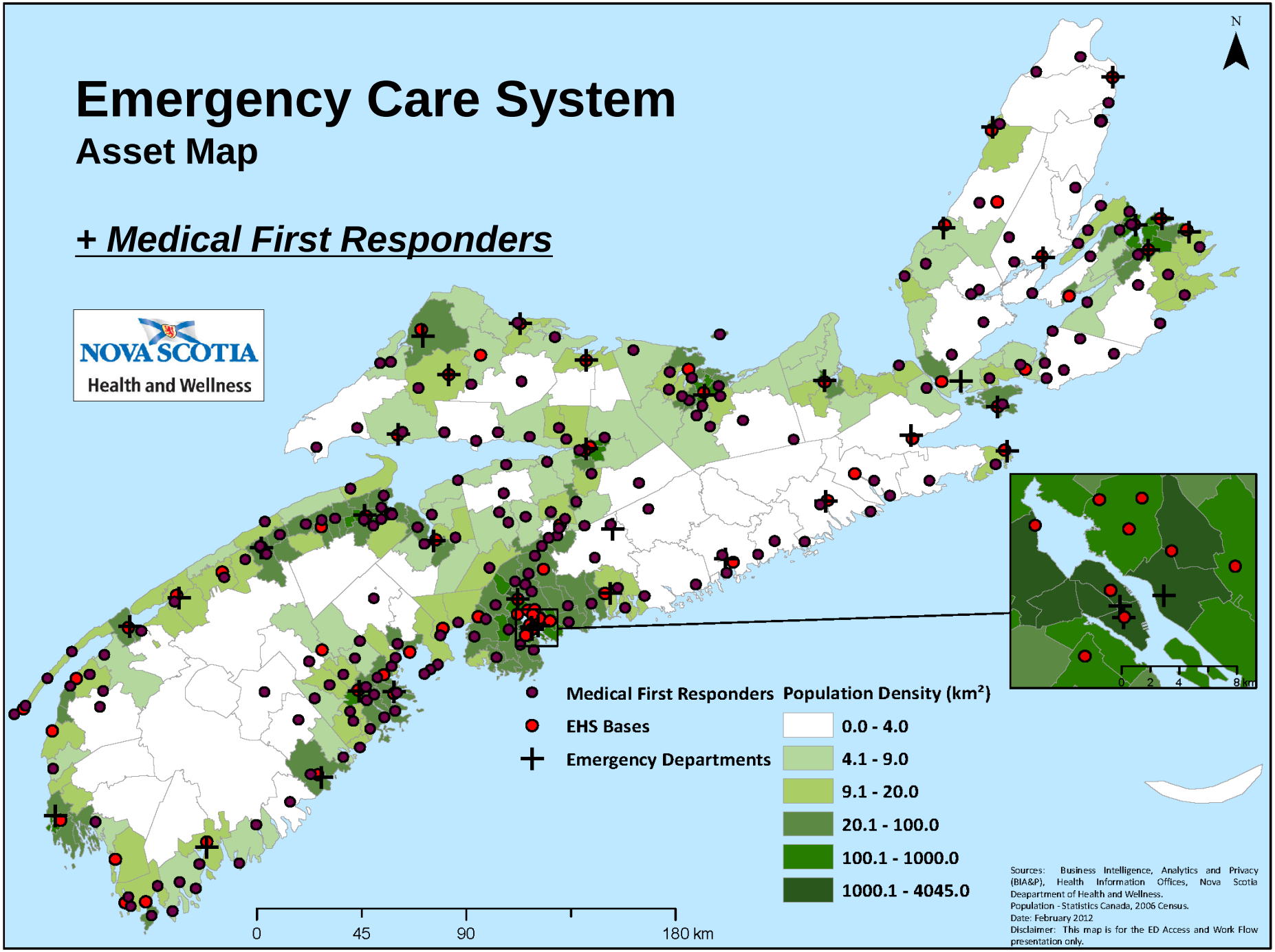




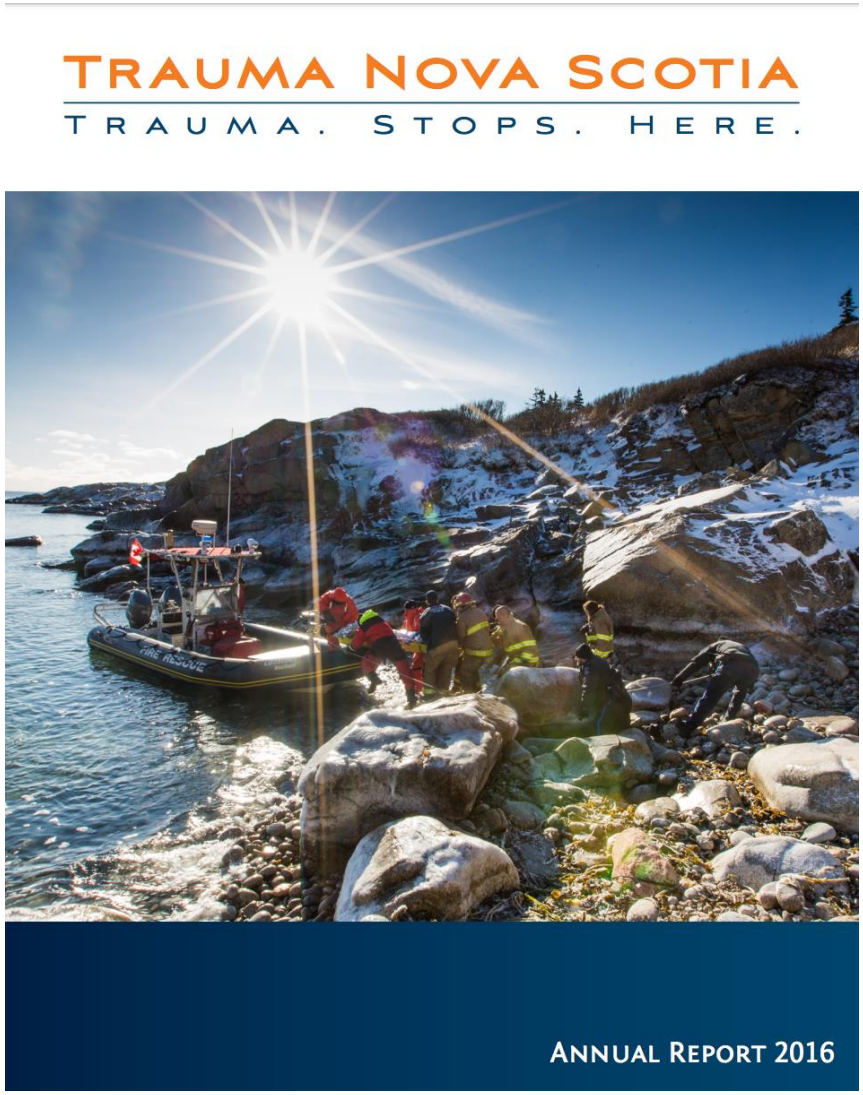
Emergency Care System

Asset Map

+ Medical First Responders



Sources: Business Intelligence, Analytics and Privacy (BIA&P), Health Information Offices, Nova Scotia Deapartment of Health and Wellness.
Population - Statistics Canada, 2006 Census.
Date: February 2012
Disclaimer: This map is for the ED Access and Work Flow presentation only.



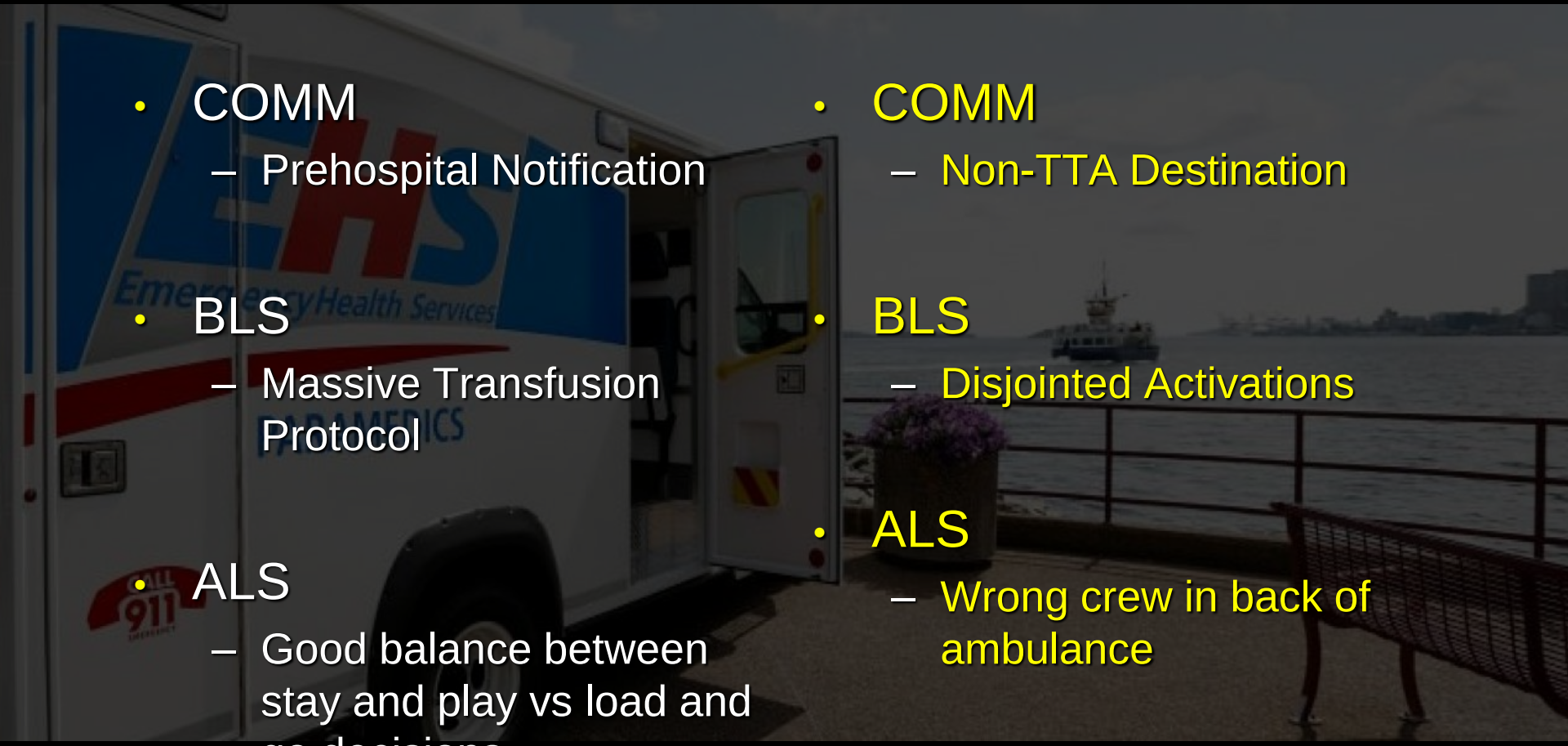
Robert Green
MD

TNS Medical Director

www.trauma-ns.com


32M
Stab wound chest
Minding own business
hypotensive

Urban Trauma: Out-of-Hospital



- COMM
  - Prehospital Notification
- BLS
  - Massive Transfusion Protocol
- ALS
  - Good balance between stay and play vs load and go decisions

- COMM
  - Non-TTA Destination
- BLS
  - Disjointed Activations
- ALS
  - Wrong crew in back of ambulance

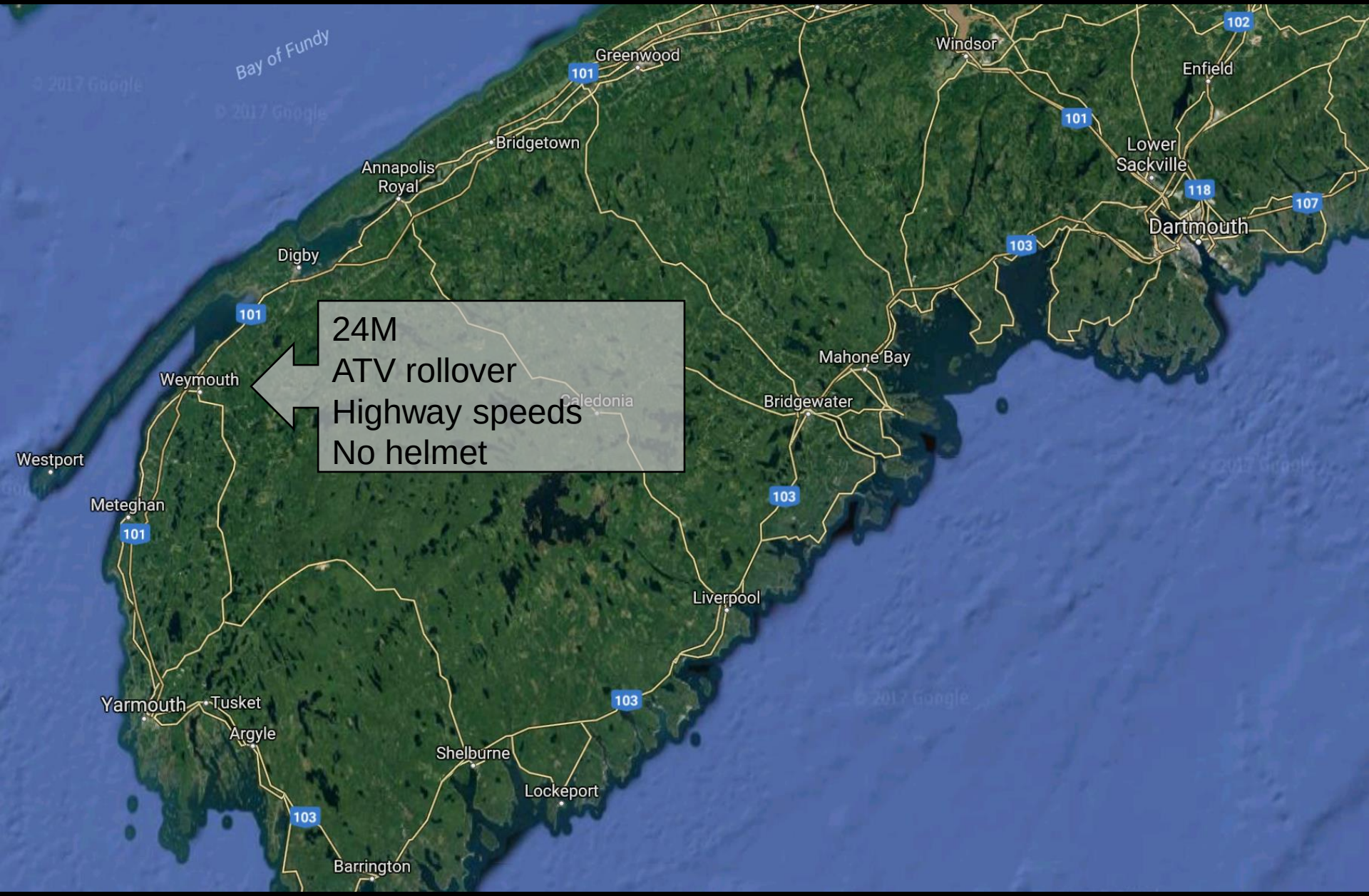
Urban Trauma: In-Hospital

- EHS/ED Interface
  - Excellent choreography
- ED/Hospital Interface
  - Other surgical patients flow into Rapid Assessment Unit
- Trauma Nova Scotia
  - Research, Quality

- EHS/ED Interface
  - Lack immediate feedback quality loops.
- ED/Hospital Interface
  - ED inflow ≠ ED outflow
- Trauma Nova Scotia
  - ?Meeting Benchmarks

Urban Trauma: Innovations

- Immediate
  - Prehospital Notification and Identification
  - Real-time EHS feedback to crews
- Short term
  - ED system flow improvements
- Long-term
  - Trauma Unit


24M
ATV rollover
Highway speeds
No helmet
Bay of Fundy
Greenwood
Windsor
Enfield
Bridgetown
Annapolis Royal
Lower Sackville
Dartmouth
Digby
Weymouth
Mahone Bay
Caledonia
Bridgewater
Westport
Meteghan
Liverpool
Yarmouth
Tusket
Argyle
Shelburne
Lockeport
Barrington
101
102
103
107
118

Rural Trauma: Out-of-Hospital

- COMM
  - Single integrated communication system
- MFR
  - Volunteer extension of the EHS & healthcare system
- Ground Ambulance
  - ‘Nimble’ Evidence-based guidelines

- COMM
  - No call-taking question for ‘Injury Onset’
- MFR
  - Variable PCR Charting performance
- Ground Ambulance
  - Offload Pressures
  - Quality culture weak
  - Inadequate analgesia

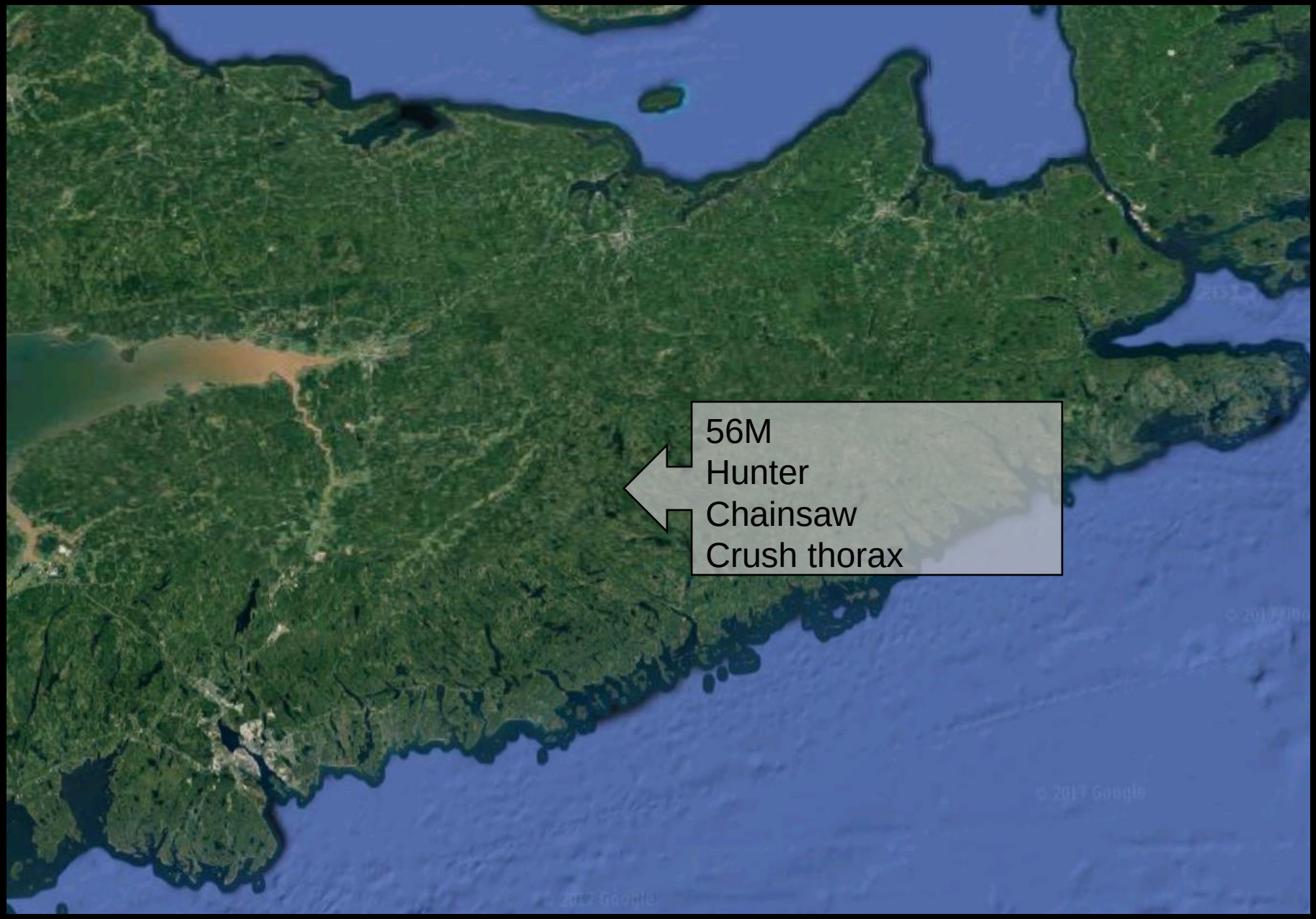
Rural Trauma: In-Hospital

- NSHA
  - Single health authority
- EHS/ED
  - Collaborative choreography strengthening through training
- ED/Surgery Interface
  - Some sites 'comfortable' managing surgical trauma

- NSHA
  - Lack feedback quality loops
- EHS/ED
  - Heli-pads out of service
  - Taking too long to transfer out
- ED/Surgery
  - Some sites 'uncomfortable' managing surgical trauma

Rural Trauma: Innovations

- Immediate
  - EHS Mobile Simulation Unit for team training across the province
  - Rural Trauma Team Development Course
- Short term
  - Become CanROC site – larger rural trauma studies
  - Improved prehospital analgesia
- Long-term
  - Review LifeFlight auto-launch
  - Continued evolution of integrated Trauma Program, including shared trauma performance measures, benchmarks and outcome data between EHS and hospital
  - Provide real-time, collaborative & meaningful feedback


56M
Hunter
Chainsaw
Crush thorax

Remote Trauma: Out-of-Hospital

- JRCC
  - Search and Rescue
- MFR
  - Specialized teams
- EHS
  - Specialized resources for rescue

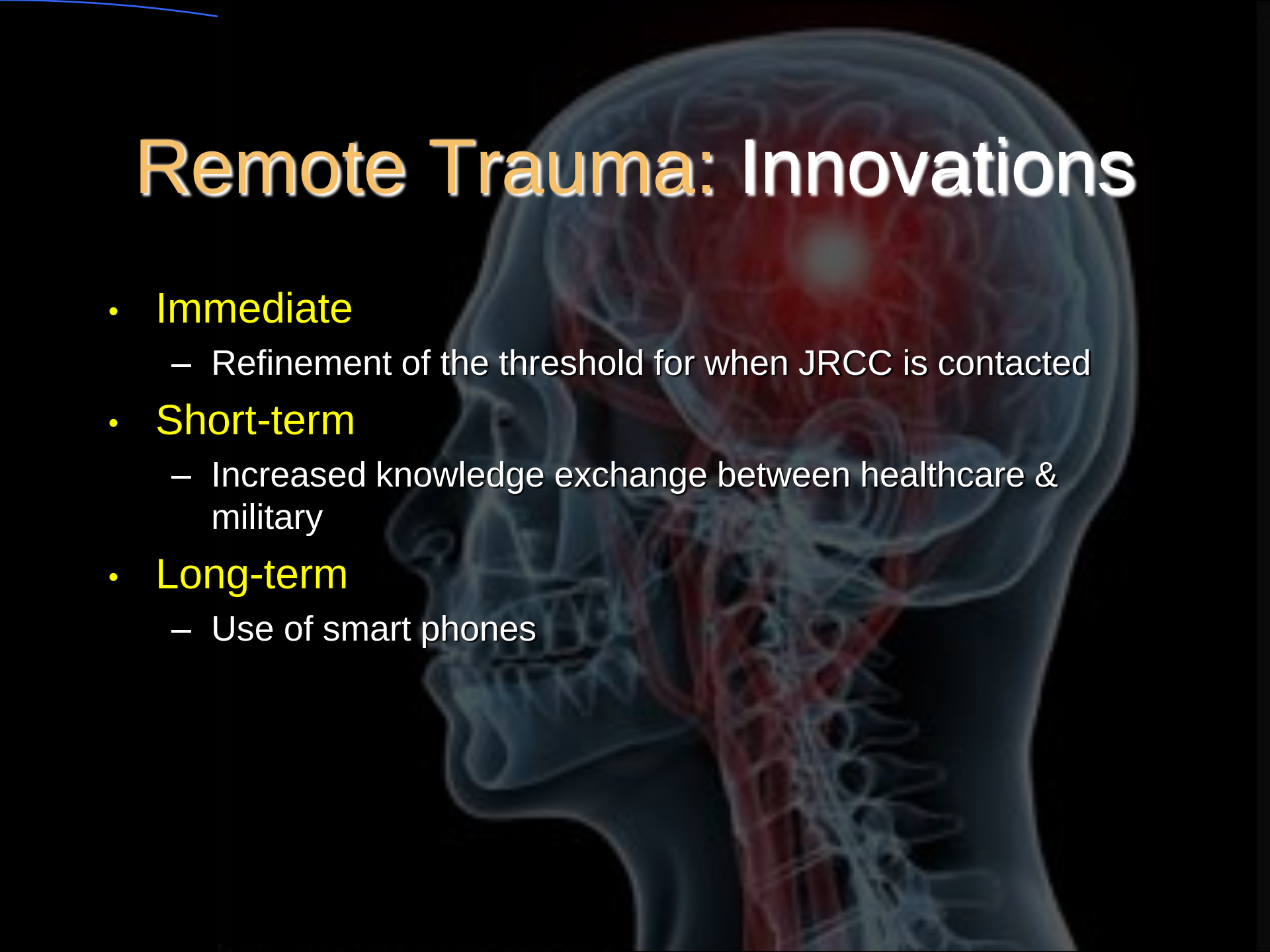
- JRCC
  - Gaps in knowledge on exactly what SAR does
- MFR
  - Risk of out of scope roles
- EHS
  - Lack ground critical care capacity

Remote Trauma: In-Hospital

- Military
  - Knowledge exchanges are taking place
- NSHA
  - Have informal ‘staging’ protocols at local hospitals
- Atlantic Provinces
  - Rapid repatriation practices

- Military
  - Don’t practice with the military
- NSHA
  - “How can I not help you” attitude at local hospital
- Atlantic Provinces
  - Gaps in unscheduled care agreements

Remote Trauma: Innovations



- Immediate
  - Refinement of the threshold for when JRCC is contacted
- Short-term
  - Increased knowledge exchange between healthcare & military
- Long-term
  - Use of smart phones

June 7 2017

Helicopter rescues injured hiker from woods north of Dartmouth

Two men were hiking when one of them hurt his back and was unable to continue.

CBC News Posted: Jun 07, 2017 4:47 PM AT | Last Updated: Jun 07, 2017 6:26 PM AT


Andrew’s
Home
Injured hiker
Anderson Lake
NHI

EMS 20-50 Celebration Symposium

Come join us in historic Halifax, Nova Scotia Canada to celebrate the 50th anniversary of mobile coronary care & the 20th anniversary of Emergency Health Services (EHS) in Nova Scotia

Exciting presentations and panels:

- History of EHS and Mobile Cardiac Care
- Captivating keynote addresses by EMS experts and founders from across North America

Even more reasons to attend:

- Opening Reception Celebrating the Past
- Emergency Medical Services Expo
- 9th Annual EMS Research Day 2017
- Gala Celebration "Birthday Party" for EHS

www.medicine.dal.ca/ems/2050.com

Poster design sponsored by Tri-Star Industries

October 23-25, 2017

EHS Emergency Health Services

DALHOUSIE UNIVERSITY

Health PEI
One Island Health System

Prince Edward Island Emergency Patient Pathway:

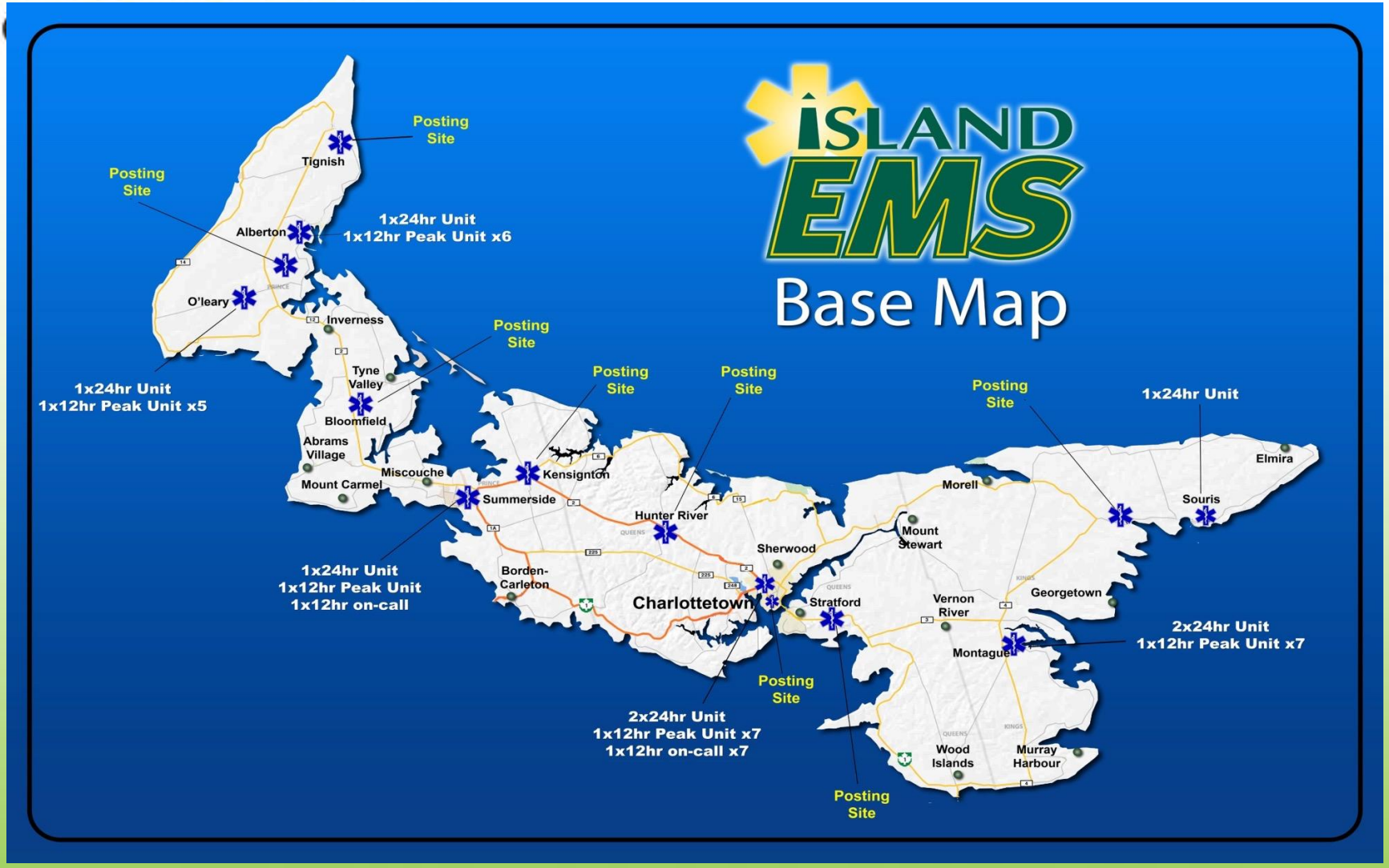
"When all the planets and stars align"

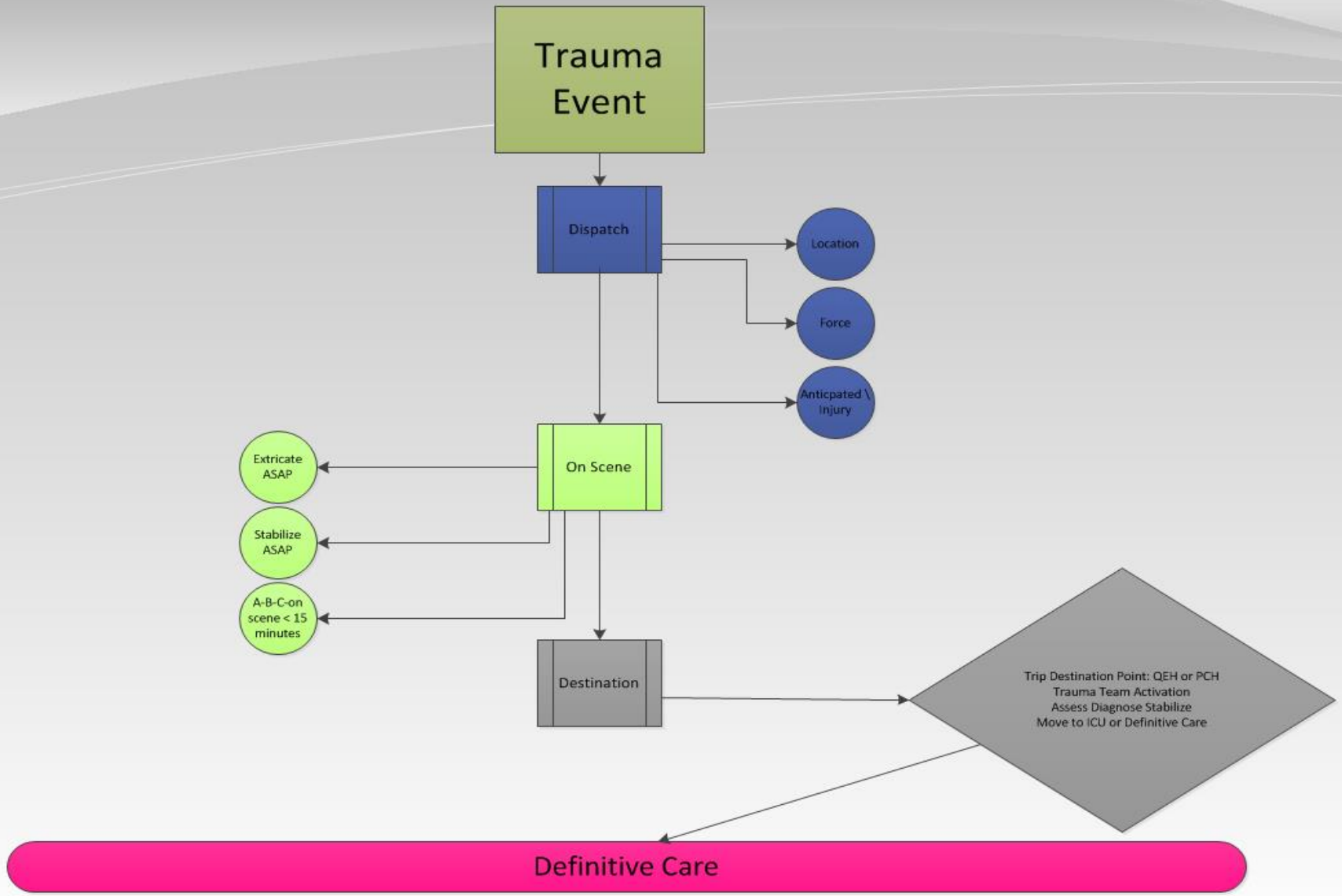
Dr Scott Cameron, MD
Provincial Emergency Medical Director
Matthew MacLeod, ACP
Holland College Learning Manager

Disclosures

None and None.

Health PEI


ISLAND EMS
Base Map
Posting Site
Tignish
Posting Site
Alberton
1x24hr Unit
1x12hr Peak Unit x6
O'leary
Inverness
Posting Site
1x24hr Unit
1x12hr Peak Unit x5
Tyne Valley
Bloomfield
Abrams Village
Mount Carmel
Miscouche
Kensington
Summerside
Posting Site
Posting Site
Hunter River
1x24hr Unit
1x12hr Peak Unit
1x12hr on-call
Borden-Carleton
Sherwood
Charlottetown
Stratford
Posting Site
Posting Site
1x24hr Unit
Elmira
Souris
Morell
Mount Stewart
Vernon River
Georgetown
Montague
2x24hr Unit
1x12hr Peak Unit x7
2x24hr Unit
1x12hr Peak Unit x7
1x12hr on-call x7
Wood Islands
Murray Harbour
Posting Site


Trauma Event
Dispatch
Location
Force
Anticpated \ Injury
On Scene
Extricate ASAP
Stabilize ASAP
A-B-C-on scene < 15 minutes
Destination
Trip Destination Point: QEH or PCH
Trauma Team Activation
Assess Diagnose Stabilize
Move to ICU or Definitive Care
Definitive Care

Geographic Context

T+32 min

Time on scene: 16 minutes

Transport Time: 7 minutes

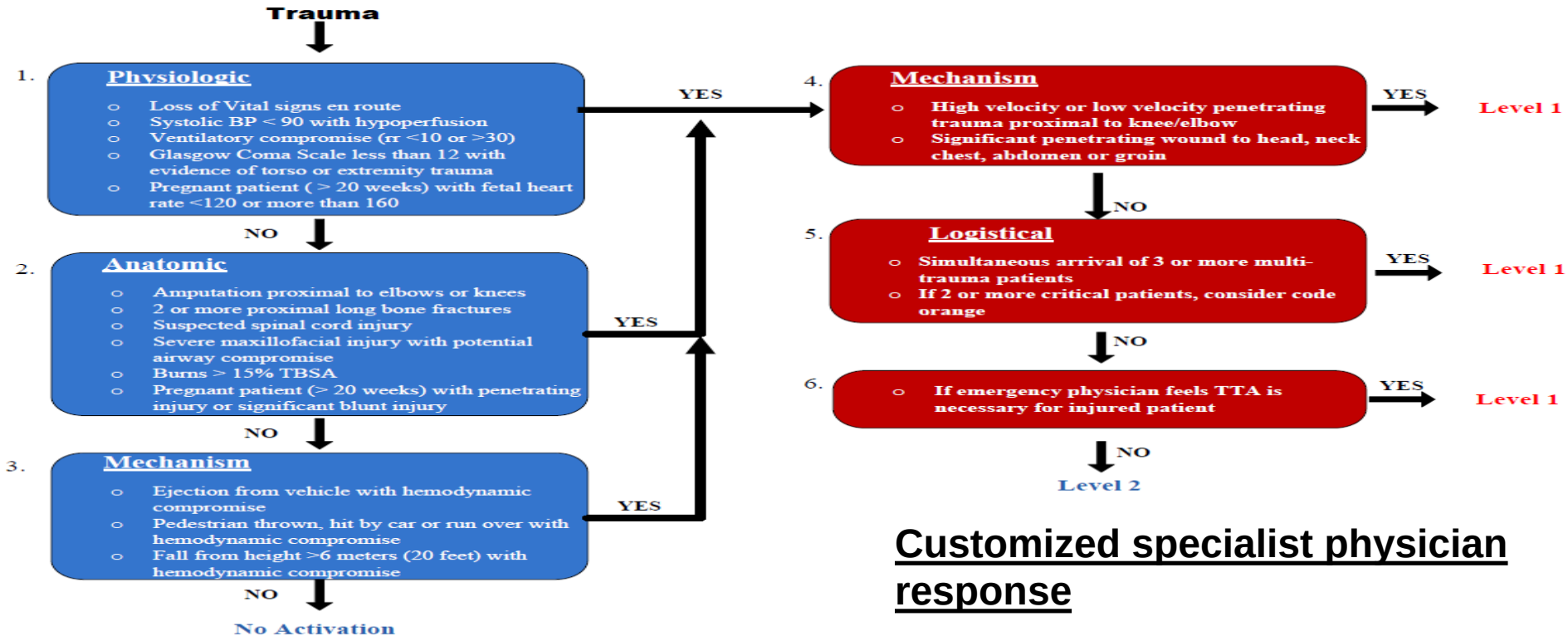
Report at 3 minutes out


AMBULANCE
EDIC
EMS

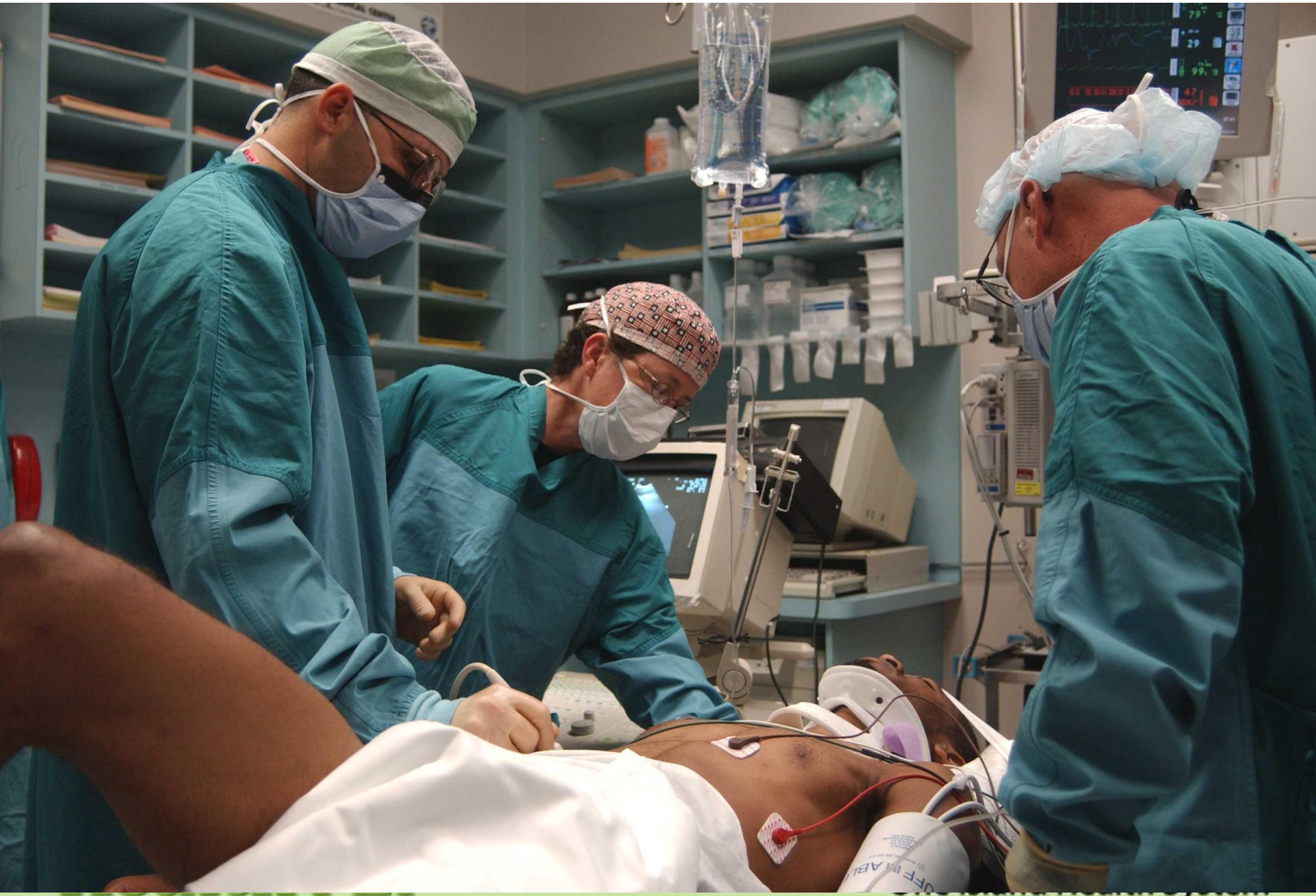

EMERGENCY / URGENCE
ENTRANCE

Trauma Room-Trauma Team Activation
Level 1

QEH Trauma Team Activation Guideline Algorithm



Customized specialist physician response



Injuries

- Fractured Spleen
- Fracture Femur
- Unstable Pelvic Fracture
- Pneumothorax
- Hemothorax
- Moderate epidural bleed

  Repeat Primary Survey! Secondary Survey

Trauma room T +42 min

Returned from CT

Transfer Decision Made

T+90

45 minutes for Life Flight to arrive

Patient has received a total of 9 units PRBC, 4 Plasma and 1 platelet. The *only* platelet available in PEI.

BTS packed 4 RBC and 4 Plasma in a cooler to go

T+120

Life Flight assessed patient in trauma bay

Mixed medications

In QEH trauma bay 30 minutes

transfer to aircraft

Health PEI

One Island Health System

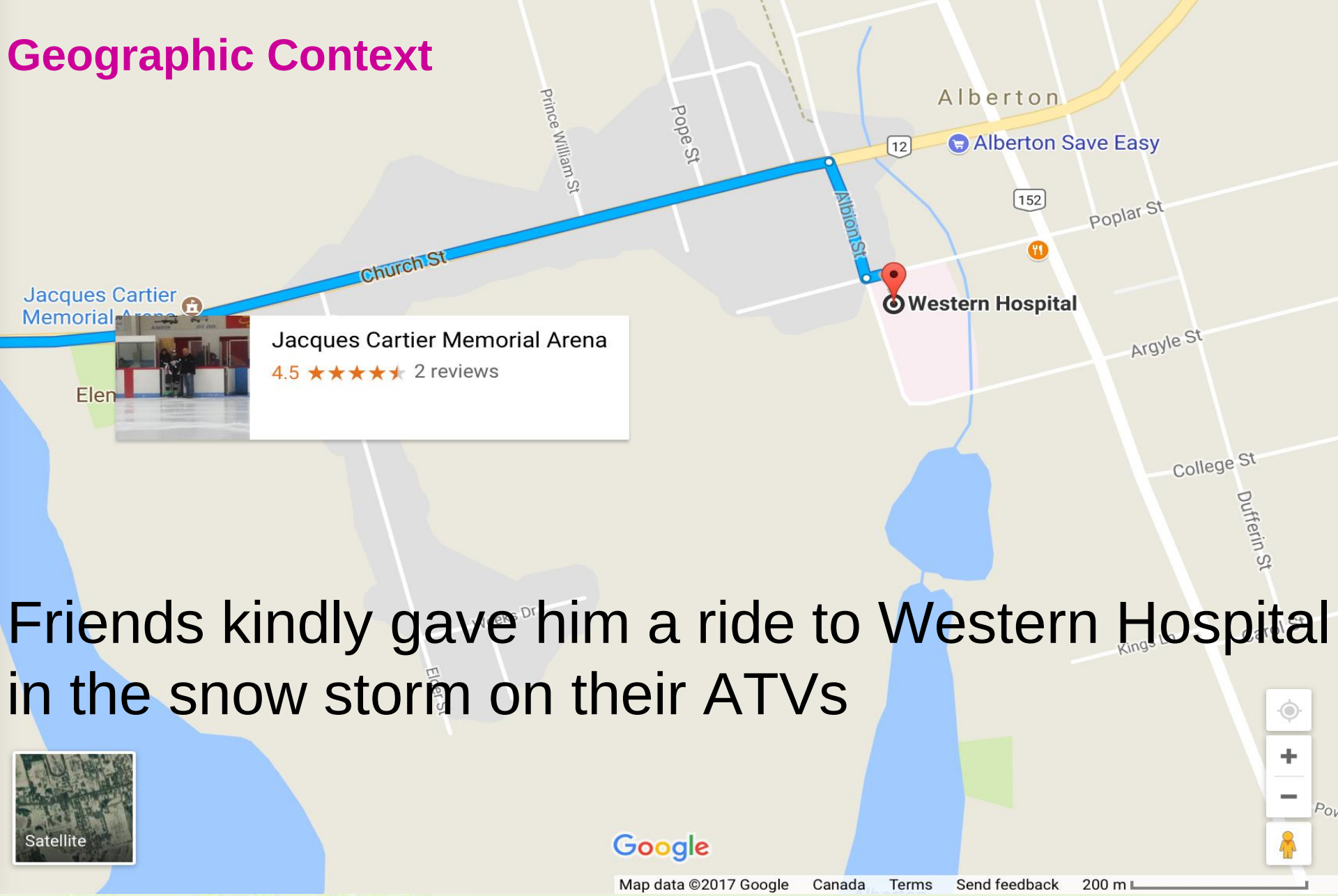
Health PEI

One Island Health System

Rural PEI: Dependent Access to Resources

2130 hrs, February blizzard
Time 0

Geographic Context



Friends kindly gave him a ride to Western Hospital in the snow storm on their ATVs

Transfer planning….T+10

Report to Online Medical Control from Western Hospital, acting as a CEC at this time of day. IMMEDIATE report call to OLMC:

Vital Signs

- GCS 14-E4 V4 M6 PERL
- 112/66
- 35.9
- 94
- 23
- BG 5.2
- SPo2 98%

Western Hospital CEC
T+30min

Paramedic –Nurse Collaborative Assessment:

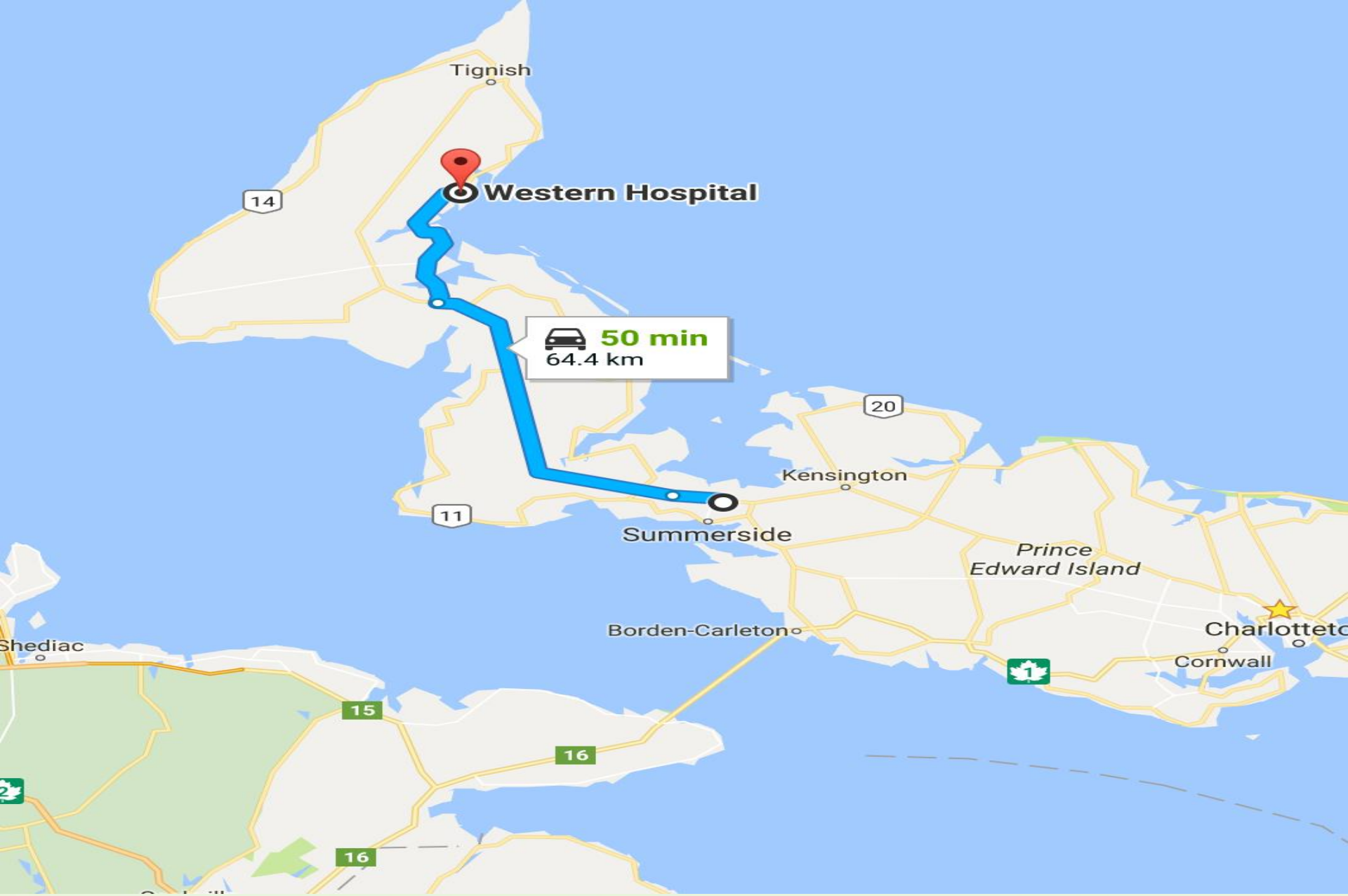
- Alert slow mentation
- R shoulder pain with obvious deformity, decreased ROM, right sided chest pain, reproducible by palpation, movement and inspiration.

Who's there? Limited resources.

Orders from Online Medical Control

- Place in C-Collar, CXR, Trauma labs, Shoulder XR, C spine XR series
- MD will view results on Provincial EMR (CIS) and PACS when complete

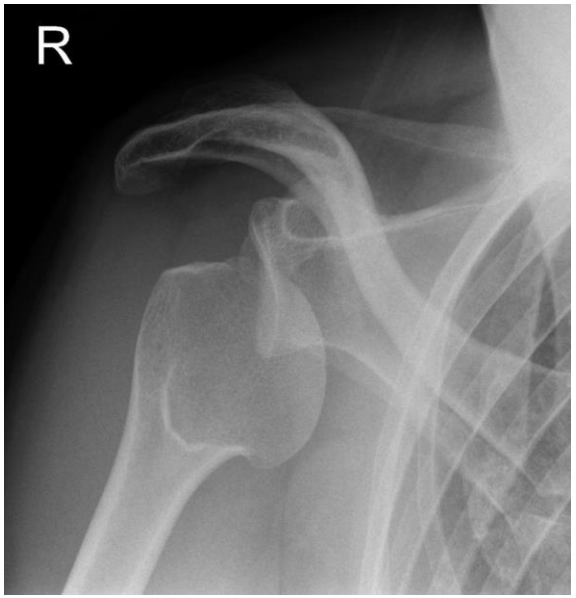
Plows are Currently off the Road;
Patient Safer at WH at Present



Health PEI

One Island Health System

T +100 min



- Unable to Transport due to weather
- Labs back:
- HgB 144
- Lactate unavailable at Western Hospital
- WBC 13.2
- ETOH 45
- No Pneumo on CXR but possible fractures of R 4th and 5th ribs
- C-spine OK on xray
- Anterior dislocation of right shoulder

Patient is moderately cooperative

Pain Management and Monitoring

Time +7.5 hours

- Weather cleared
- 0500: Plow dispatched to facilitate and assist transfer via EMS.
- Just starting to open roads in Western PEI

T +10 hrs At PCH

Physician Assessment

Procedural Sedation and Shoulder Reduction Successful

Time +10 hours

- Patient admitted for 24 hours observation due to probable concussion and risk from pulmonary contusion on CT
- Day Staff are arriving

Strengths of acute care system for trauma

- Good destination policy
- skilled clinicians and a culture of learning and skills practice
- increasing using simulation to develop and maintain skills
- common order sets and PACS

Strengths of EMS System

- Committed to ACP on every truck in system
- Early adoption of clinical standards
- EMS System directly influenced by Health PEI Clinical Professionals resulting in great continuing care

Struggles

- Currency of skills for all providers: low volumes of highest acuities at all sites
- Burden of Geography: For Definitive Care when off Island services are required

Atlantic Trauma and Emergency Medicine Conference: *Trauma Panel Discussion*

September 2017

Presented By:
Dr. John Campbell CFPC-EM
Mr. Adam Fisher ACP

Graphic Summary of Provincial Resources

Some Numbers for EMS services In NL

- 144 Road ambulances
  - 27 private operators
  - 22 Community Based Operators
  - 12 Hospital based services
- Number of Paramedicine providers
  - 347 EMRs
  - 551 PCPs
  - 72 ACPs

Urban Trauma Case NL

55 Corner Brook figure skaters involved in bus crash when DRL bus leaves road at highway speeds

Urban Trauma Case: Out of Hospital Phase

- Top 3 things that went well:
  - Coordination at scene
  - Scalability of resources
  - Transport times
- Top 3 things to improve on:
  - Common communication system/net
  - Prehospital activation or code orange plan
  - Supplies on scene (disaster trailer)

Urban Trauma Case: Hospital Phase

- Top 3 things that went well:
  - Availability of medical personnel from multiple services.
  - Timeliness of response
  - Low volume of patients in department prior to event
- Top 3 things to improve on:
  - Medical personal activation plan
  - Recognition of department over capacity
  - Familiarly with CODE ORANGE PLAN

Innovations for other provinces to consider

- *Realities of Rural Emergency Medical Services Disaster Preparedness.* **Prehospital and Disaster Medicine.** Vol.21, No.2
  - *The best way to ensure an effective response to a large-scale event is to concentrate on improving the effectiveness of day-to-day operations.*
  - *The focus needs to be on (1) maintaining an all hazards approach to disaster recognition, containment, and response; (2) improving inter-agency communication skills and capabilities; and (3)increasing involvement in regional planning and developing a clear understanding of the roles and responsibilities of local EMS along with other agencies.*

Remote Trauma Case

40 male falls from height in remote location sustaining back injury

Remote Trauma case: Out of hospital Phase

- Top 3 things that went well:
  - EMS responder part of Search and Rescue services and familiar with geography and availability of services.
  - Geography allowed for use of air asset.
  - EMS had adequate clothing for the environment.
- Top 3 things to improve on:
  - System needs to be more formal and dependent on policy and procedures rather that personal.
  - Air assets need capacity to perform basket extraction.
  - ALS providers (pain management).

Remote Trauma case: In hospital Phase

- Top 3 things that went well:
  - Pre hospital report allowed for preparation of trauma bay .
  - Timeliness of Imagery.
  - Time to removal of board in department.
- Top 3 things to improve on:
  - Landing pad at regional referral system
  - Communications with Aircraft
  - Coordination with other rescue agencies (common communications net)

Innovations for other provinces to consider

- *An Optimization Model for Locating and Sizing Emergency Medical Service Stations.* **J Med Sys;** 34:43-49
  - The success of EMS depends upon the operational success of integrating emergency vehicles, medical personnel and supporting equipment, and medical facilities.
  - Optimally locating and sizing of such services is an important task to enhance the responsiveness and the utilization of limited resources.

Rural Trauma Case:

4 yo male riding a peddle bike struck by a car at municipal speeds

Rural Trauma case: Out of hospital Phase

- Top 3 things that went well:
  - Rapid arrival at and transport from scene
  - Protocol based transportation
  - Availability of online medical support
- Top 3 things to improve on:
  - Communication with receiving facility prior to EMS arrival at scene
  - Availability of ACP on call
  - Additional Pediatric specific equipment on ambulance

Rural Trauma case: In hospital Phase

- Top 3 things that went well:
  - Pediatric trauma bay was prepared prior to patient arrival via EMS system
  - The bay was equipped with a complete Braslow cart system
  - Extra clinical staff was on hand to manage patient
- Top 3 things to improve on:
  - The facility did not have a Braslow bag for transport to a higher level facility.
  - Most responsible physician was unfamiliar with BLS paramedic skill sets.
  - Transporting physician unfamiliar with the equipment on BLS ambulance

Innovations for other provinces to consider

- *International Comparison of Prehospital Trauma Care Systems.* **Int. J. Care Injured;** 38, 993-100
  - Dispatching a physician to the scene may be associated with lower early trauma fatality rates, but not necessarily with significantly better outcomes on other clinical measures.
  - EMS system adopts a particular model or care (ALS or Doc ALS) almost all of the patients receive the level of care required.