

BC's Mobile Medical Unit – An Innovative Health Sector Resource



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2011 Eighth Annual Bi-National Cross Border Workshop –
“The Health Impacts of Disasters: Infectious Diseases and
Beyond” – May 25th, 2011



BC's Mobile Medical Unit

Presentation Outline

History & Physical Components

First Phase

- **Preparation & Planning - 2010 Olympic and Paralympic Winter Games**
- **2010 Winter Games Experience and Lessons Learned**

Second Phase

- **Legacy and PHSA Ownership**
- **Operational Plan for 2011/12 and Partnership with six Health Authorities and MOHS**
- **Primary and Secondary Roles**

Questions and Discussion

BC's Mobile Medical Unit History

- **IOC** –Required Life Limb or Threatened Organ capability in Whistler for Olympic and Paralympic Family
 - LLTO off the Alpine, Sliding Centre, Olympic/Paralympic Park
 - Transportation Blockage (road and air)
 - Mass Casualty Incident
- **VANOC/MOHS/VCH** determined best option: Mobile Medical Unit Integrate the MMU with Whistler Polyclinic
- **VANOC Medical Services** – Dr Jack Taunton, Dr Mike Wilkinson Polyclinics (Whistler and Vancouver)
- **Vancouver Coastal Health (VCH)** – **VGH** identified as Olympic and Paralympic Family Hospital & **MMU Extension of VGH**

BC's Mobile Medical Unit

History – continued

- **MMU designed and Manufactured in Chicago – Odell International & Oshkosh Specialty Vehicles**
- **MOHS/PHSA/VANOC took leadership role in reviewing options for post Games legacy options**
- **Phase 1 - VANOC Ownership during 2010 Winter Games**



BC's Mobile Medical Unit - Components

- **2 Trailers**
 - **Hospital Trailer**
 - **Support Trailer**
- **Oxygen Concentrator**
- **2 Volvo Tractors**
- **3rd Smaller trailer**
- **1 GMC Truck**



MMU Support Trailer

- 2 level configuration
- Med/Surg Supplies & Equipment
- Small Office/Lounge
- Kitchen/Bathroom/Shower



Lightweight Trailer

- Large tent (approx 100 person Capacity)

Mobile Medical Unit

- Large Tent Configuration & Oxygen Concentrator



O2 Concentrator
-Own supply to MMU Hospital Trailer

Large Tent
-Wraps around MMU Hospital Trailer
-Lighting & Heaters



BC's MMU Hospital Trailer – Interior and Exterior



Hospital Trailer

4 monitored bays
6 non-monitored
DI – U/S; X-ray (basic)
PACS capable
Lab - ISTAT
IMIT connectivity

Detailed listing of
Equipment available



1 Table OR
Detailed Listing of
Equipment
available

MMU Exterior – 3 slide outs
Diesel powered or Shore
power -City
Water & Waste Hook up





Patient Care Area

Flexible to meet Patient needs

**“Critical Care” type Configuration
-Resuscitation,
Critical Care Holding
(CCU, ICU, PAR)**

BC's Mobile Medical Unit

Physical Capabilities

Self Sufficiency Mode

- Diesel Generators x2 (one on each Tractor) for redundancy
- Support Trailer has own smaller diesel tank for power
- Water supply – top ups
- Waste Removal – rely on waste disposal units

Connectivity Mode

- “Shore Power” Hook Up
- City Water Connection
- City Waste Connection
- IMIT Connectivity with Local Hospital (Phone, Computers)

Mobile Medical Unit

Phase 1 – 2010 Olympic & Paralympic Winter Games Planning

Partnerships

- **Public Health Agency of Canada**, VANOC received a \$1million grant to specifically train/educate MMU Medical Personnel Team, Accommodation, Meals, Travel
- **Ministry of Health Services & PHSA**
- **Vancouver Coastal Health (VCH)** – VGH designated as Olympic and Paralympic Hospital, MMU a part of VGH (Surgical/Critical Care)
- **Fraser Health Authority** (Supplies)
- **VCH Education/Learning & Development**
- **VGH Trauma Services CFTTC(W)**
- **Trauma Services VGH**
- **GE Healthcare**
- **BC College of Physicians and Surgeons,**
- **College of Registered Nurses BC**
- **Health Canada**

Mobile Medical Unit

Phase 1 – 2010 Olympic & Paralympic Games Planning

- **Medical Personnel Selection & Recruitment**

- Clear qualifications/criteria for selection for national recruitment
- Review team of experts representing Anesthesia, Surgery, Trauma, Emergency, Critical Care, Operating Room and Emergency Nurses, & Respiratory Therapy (NOHERT, VCH, VANOC)
- Medical Credentialing established through VGH, VCH & VANOC Accreditation

- **Scheduling**

- 10-14 day rotation established with coverage
 - Prior to Olympics (Commenced January 31st, 2010),
 - Olympics
 - Between Olympics and Paralympics,
 - Paralympics and Post Paralympics
 - 17 members on each team aiming for redundancy & capacity
- on-call factors 32

Mobile Medical Unit

Phase 1 – 2010 Olympic & Paralympic Games Planning

Results

- 105 team member team (17 members on each team)
- 5 teams of 17
- NOHERT members (approx 20 a part of team)
- Each Team comprised of:
 - 2 Trauma/General Surgeons
 - 2 Anesthesiologists
 - 2 Orthopedic Trauma Surgeons
 - 4 Operating Room Nurses
 - 4 Critical Care Nurses
 - 2 Emergency Nurses
 - 1 Respiratory Therapists
- Denominator – Medical Staff

- 1560 Olympics, 871 Paralympics



Competition Venues



- **Whistler Olympic Park/**
- **Whistler Paralympic Park**
Biathlon, Cross-Country Skiing (Olympic and Paralympic), Ski Jumping, Nordic Combined
Capacity: Olympic 12,000, Paralympic 6,000



- **Whistler Creekside**
Alpine Skiing
Capacity: Olympic 7,600, Paralympic 6,000



- **The Whistler Sliding Centre**
Bobsleigh, Luge and Skeleton
Capacity: 12,000

Mobile Medical Unit

2010 Winter Games – Competition Venues



Mobile Medical Unit

Whistler Athlete's Village – 2010 Winter Games



MMU -Location & Capability with Whistler Athlete's Village

Integrated with the Polyclinic, Levels of “Readiness” based on event schedule & sit awareness

Capability

- Critical Care
- Surgical
- DI
 - CT, MRI, C-Arm,
 - Portable X-ray, Ultrasound
- Lab
- Blood and Blood Products
- Pharmacy
- Public Health



MMU Hospital Trailer and Tractor



MMU Hospital Trailer Integrated with Whistler Polyclinic

VANOC Temporary Structure (tent)

MMU Highlights WVL



**Mobile Medical Unit - Surgical Capacity
Operating Room Configuration LLTO Surgical Procedures only
GE Anesthesia Machine, C-arm, PACS**



WVL – Polyclinic Highlights



Mobile Medical Unit

Medical Personnel Training/Education

Training

- **Four phases – VGH CFTTC(W), CESEI & VCH Learning & Development Support and Expertise**
- **VANOC Received \$1 Million grant from PHAC for MMU training, travel, meals, accommodation, uniforms**
 - 2- day workshop in Vancouver for all MMU team and some Polyclinic team members (October, 2009)
 - On line web based modules (Dec 2009/Jan/Feb 2010)
 - Just-in-time Simulation Training 1.5 days of training prior to deployment up to Whistler (For each of the 5 teams)
 - Daily Simulation training within MMU/Polyclinic upon deployment
 - **Daily Simulation** - Variety of Scenarios (MMU Teams – each team completed Long Line Helicopter, Code Blue within Therapy, Dentistry, MRI, Mobile Response within the Village)

Long line Rescue Exercise from Whistler Creekside to Mobile Medical Unit/Polyclinic





MMU – Long line to MMU Resuscitation Bay, and Operating Room



**Resuscitation Bay
MMU/PC Team
Simulation/Practice**

Team Trauma Co-Leadership
Specific team responsibilities
Debriefing after each simulation

**Operating Room – State of Readiness
Simulation Practice**



Medical Personnel Training/Education Cont'd

- **Validation Study currently underway** “Creating a Gold Medal Olympic and Paralympic Health Care Team: A Validation Study of the MMU Training for the Vancouver 2010 Winter Games
- **Ethics approval** – survey distribution
- **Will inform future educational training programs for large scale events and MMU Program**

MMU – Games Time (Olympics and Paralympics Assessment/Treatment of multiple patients)

- **MMU Patient Visits** – approx 20-25 admissions to MMU - required observation and then discharged from MMU.
- **19 transferred directly from MMU to VGH** (road and air) – Trauma Services, Orthopedic Trauma, Spine, Neurology, Cardiology, Internal Medicine, Gastroenterology.
- **Denominator 3124 Olympics, 1633 Paralympics Medical Encounters**



MMU Highlights - Lessons Learned from its first deployment

Small Cadre of Individuals essential who were experts with respect to the MMU/Polyclinic facility

(Operations & Medical Leads)

-Prompt issue resolution.

-Protection and Maintenance of MMU assets

-This will inform the MMU staffing plan for Phase 2



Integration essential MMU and Polyclinic

-Different affiliations, received different levels of training, volunteer turnover significant, BCAS a key partner.

Transparency of Different Affiliations (some paid staff, majority were volunteers, across Province and Canada)

Frequent real-time Communication essential

MMU Highlights - Lessons Learned from its first deployment cont'd

- **Advance Planning/Protocol development** essential - Every protocol was used except mass casualty, and protocols worked well.
- Use well established **Protocols/Processes** where ever possible (eg **BCBedline**) Cooperation and support to CF, RCMP (VISU), WHCC, et al
- Development of new guidelines essential – common understanding **Levels of Readiness** (Level 1 – 5 minute response, vs Level 3 30-40 minute response) – based on risk
- **Handover** between MMU teams critical time (adjusted schedule accordingly)
- **Daily Team Simulation Exercises** (MMU/Polyclinic integration) as well as daily section training essential.
- Transparency of **Different Affiliations** (some paid staff, majority were volunteers)
- **All focused on same goal**

Phase II

BC's Mobile Medical Unit – Development as a Provincial Program

- Legacy – PHSA, MOHS, Six Health Authorities
 - Primary and Secondary roles within BC
 - MMU Advisory governance model
 - Operational Plan and Approval for 2011/2012
 - Health Authority Engagement & Training
 - Progress to date – Year to Date 2011/2012 Fiscal Year
- VIHA
 - IHA
 - Northern Health
 - VCH & PHC
 - FHA
 - PHSA

Phase II

BC's Mobile Medical Unit

PHSA Ownership Journey 2009 to present day

- **PHSA/MOHS** developed a Business Case & Feasibility/Options Analysis (Krueger & Associates November 2009)
- **Chief Financial Officers** within each **Health Authority** Committed to keeping MMU as a resource in BC.
- As a part of the 2010 Winter Games, **MMU became a part of a legacy** with MOH providing funding for Capital Acquisition and transfer of responsibility to PHSA.
- MOHS and CFO's requested development of an **Operational Plan**
- **MMU Advisory governance model**, reporting structure within PHSA and relationship to each of the six Health Authorities and MOHS.
- Operational Plan completed and December 2009 received approval by HOC for One-time and Operational Funding for 2011/2012.

Phase II - BC's Mobile Medical Unit – Operational Plan Integration with HA Emergency & Business Continuity Plans & Training

- Completed June, 2010 through consultation with numerous stakeholders
 - MOHS (Emergency Management Unit)
 - IHA
 - VIHA
 - Northern Health
 - VCH and PHC
 - FHA
 - PHSA
 - BCAS
 - Vancouver Heavy Search & Rescue,
 - CESEI
 - Justice Institute,
 - Public Health Agency of Canada (PHAC)
 - Alberta Ministry

Establishment of MMU Advisory Committee

Membership:

- **PHSA Executive Sponsor**
- **Health Authority Representation (3 leads from each of the six HAs)**
 - Emergency Management/Business Continuity
 - Physician Leads
 - Operational Leaders (portfolio Emergency, Trauma, Critical Care, OR)
- MMU Operations and Medical Leaders (MMU staff)
- MOHS
- Other(s)

Criteria to be developed for MMU deployments “pre-sanctioned criteria”

Annual review of Operational Plans and Evaluation

Monitoring of performance indicators

Phase II

BC's Mobile Medical Unit – Primary Role Disaster Response/Recovery

- **Disaster Response**
- A resource to the Province, each of the six Health Authorities, integrate within each of their regional plans, local plans.
- Assist in sustainment phase, or earlier phase dependent on disaster
- Provide physical space, is self sustainable for short duration
- Other similar units (eg MED 1 in Carolina – provided role after Hurricane Katrina during Recovery Phase)
- Health Authority to provide medical personnel
- MMU Cadre team sets up, resource to utilize the facility, takes down, collaborates as required to provide guidance, just-in-time training, patient flow concepts.

Phase II

BC's Mobile Medical Unit – Primary Roles



Provide Business Continuity
Within Health Authorities
-Interim lost physical capacity
(fires, floods)

Rock Slide Sea to Sky Highway



Business Continuity

Other example – of Health Authorities Challenged with blockage

Potential Secondary Roles

- **Medical Education/Simulations** - MMU Program, then potential to expand education opportunities eg. CESEI, JI, BCIT, Royal Roads, University of Victoria, UNBC
- **Mass Gathering/Event Support** -Opportunities for mitigation of costs and also decrease the impact to local emergency department surge (leasing arrangement for large scale mass gatherings/events that require medical service infrastructure- Sporting Events, Large Festivals, others)
- Cross Border Alliance
- Public Health Agency of Canada (G8/G20 example)

BC's Mobile Medical Unit Status Update as of May 2011

- **Funding in place based on Operational plan**
- **Each of the six HAs are funding the MMU – true partnership**
- **Licensing, Insurance**, recent top to bottom **Maintenance** completed, Approved **Inspections**
- **MMU Advisory Meetings/Beginning** to draft up planned training deployment schedule for 2011/2012
- **Engagement with Health Authorities and MOHS** – Recent Open House held May 19, connections through Mass Casualty Planning
- **Operations** - Draft Deployment Criteria, Deployment Ready end of June*,
 - Strategic decision to deploy MMU annually to each Health Authority, drafting a Planned Deployment Schedule in concert with local Health Authority – building upon existing plans, integrating within these plans essential
 - Supply Management
 - MMU Educational Program
- **MMU Cadre Team Recruitment & Training**
- **Quality and Safety**
 - SOPs, protocols in development

Protection of the Assets: Storage Warehouse in Delta – Views of Front of MMU Hospital Trailer, O2 Concentrator, Support Trailer & Small Trailer

Alarm system,
Medical Equipment worth \$1.3 million;
medical/surgical supplies \$25,000;
Surgical Instrumentation \$50,000.



BC's Mobile Medical Unit Strategy – Planned Deployments throughout the Province of BC/Familiarization and Practice

- Annual deployments to each Health Authority for training and education (eg. 3-4 day deployment)
 - Curriculum Development, and Simulation within the MMU – Education of Facilities, Biomedical Engineering, EMBC leads, Medical Personnel training and simulation to work in the unit in case there are needs for business continuity, adapt to needs build capacity within each region, Emergency Preparedness Exercises.
- Within this framework, Core Mission of Response and/or Recovery maintained and in addition creation of Network of trained clinicians.
- More frequent deployments, visible in each Health Authorities throughout the Province (Valuable asset to the province), annual training in each of the 6 Health Authorities

Development of a MMU Cadre Team - Essential

- This model is based on Phase 1 experience at 2010 Winter Games, and some consistency with North Carolina MED 1, LA.
- Recruitment of Operations Lead; Medical Lead, Facilities/Logistics/Deployment Leads, Manager/Educator, and Administrative Assistant (max of 3.9FTEs). All multi-skilled as much as possible.
- Responsible for maintaining & protection of all assets, preparing the MMU in a “state of readiness” to deploy throughout BC.
- Deploying the MMU, set up and closure and transport ready
- Linkages to Health Authority, MOHs, for smooth transition once deployed, during deployment, and post deployments
- Education annually to each Health Authority
- Evaluation of performance – development of KPIs
- Business Opportunities, networking with potential partners

DRAFT MMU Deployment Criteria (Unplanned)

- Response is to an emergency situation within a region, with local hospital code orange, and/or MOHS state of emergency status
- Local Medical personnel are available but physical environment compromised/closed*
- Requester will cover the costs associated with deployment, with CEO (or designate) to CEO PHSA (or designate) request
- *The ability to mobilize a “Medical Reserve” team specifically trained to work within the MMU (Critical Care and Surgical Capacity) may be possible.

DRAFT MMU Deployment Criteria (Unplanned - Algorithm)

- Will there still be an important recovery role and/or other role to play once the MMU and the team arrives (eg. If arrival in 12-24 to 48 hours)?
- Is this expected for an interim period of time and estimate of length of deployment?
- Will a local hospital be able to support the MMU (eg pharmaceuticals, lab, DI, sterilization of instruments)?
- What are the consequences if the MMU is not deployed?
- Who needs to be informed when the decision is made and who are the other stakeholders that need to be communicated with so that transparency is maintained?
- Other questions to consider?



Future Deployments

Deployment “ Ready Status”

Categories:

CTAS 4/5

CTAS 3/4/5

CTAS 1 and 2



Future Deployments:

Operating Room

**Exact Procedures
TBD**

BC's Mobile Medical Unit - Acknowledgements

- Each of the Health Authorities and MOHS
- Mr John Andruschak
- Mr Robin Gardner
- Dr Ross Brown
- Dr Jack Taunton
- Dr Mike Wilkinson
- 2010 Olympic and Paralympic Winter Games “Gold Medal” Medical Volunteers

Questions and Discussion



Mobile Hospital, 1936

Throughout the years, VGH reached out to the community by participating in city events and celebrations. Public-spirited displays helped promote the hospital and also assisted in fundraising efforts. Often they would highlight new technology and demonstrate how the hospital was keeping up with modern trends. One of the more unusual and popular of these was a travelling display, a mobile hospital that was first used for Vancouver's Jubilee Celebration in 1936. The sleek, aerodynamic trailer and its matching car, painted white with red crosses, were a crowd-pleasing hit. The trailer came complete with its own hot water supply. Source: Vancouver Coastal Health | 3111740 | Image: Vancouver Coastal Health | 3111741

BC's Mobile Medical Unit

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