

BC's Mobile Medical Unit

ITLS International Trauma Conference

November 8, 2013



Disclaimer:

The presenters do not have a significant financial relationship to report.

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Session Overview

- **Session Objectives**
- **What is the MMU?**
- **Background**
- **Roles & Capabilities**
- **Deployment Case Studies**
- **Summary**



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Session Objectives

Participants will learn:

1. MMU key roles within the province of BC;
2. Four levels of clinical capability within the MMU;
3. Clinical and facility considerations for integrating a mobile health facility into a hospital or health centre; and
4. How a mobile health facility can increase clinical response capacity during planned or unplanned events.

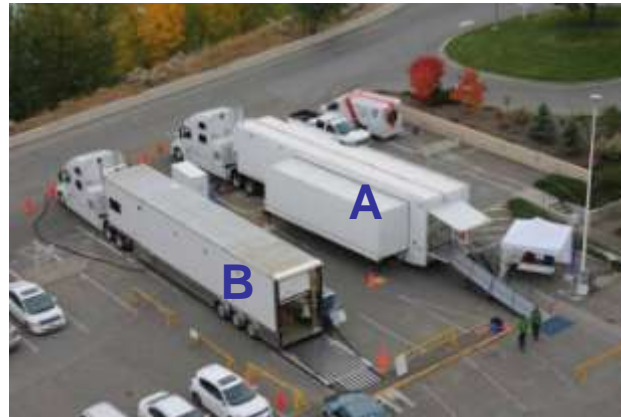
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What is the MMU?

- A- Hospital trailer
- B- Support trailer
- C- Dually truck
- D- O₂ concentrator
- E- Inflatable tent (2)
- F- 100-person tent
- G- Ramp canopy



MMU Hospital Trailer – Primary Care Area



- Flexible space
- Up to 6-10 bays for patient care
- 4 high-acuity monitored bays

MMU Hospital Trailer – Primary Care Area



MMU Hospital Trailer – Multi-purpose room

Positive pressure HEPA filtered room is a flexible space that can be used as:

- Operating room (emergency life-saving surgery);
- Minor procedures;
- private examination space;
- semi-isolated additional clinical area;
- Administration; or
- Storage or respite.



MMU Hospital Trailer – Multi-purpose room



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Background

2010 Olympic & Paralympic Games

Critical Care & Emergency Surgical Capability

- Provision of patient care
→ 43 patients, 13 BCAS transfers
- Olympic/Paralympic Medical Volunteers participated in daily exercise/simulation in the MMU.



Background – Legacy to the Province

Provincial Resource

→ BC Ministry of Health purchased the Mobile Medical Unit and requested PHSA to:

- own and operate;
- protect and maintain; and
- work with the six Health Authorities in developing a provincial service to expand upon provincial clinical response capacity.

→ Each of the six Health Authorities share equal operational costs



Clinical Expertise

The MMU clinical team is derived of trauma-focused clinical educators who bring expertise in:

- Pre-hospital care
- Air medical transport
- Disaster medicine
- HazMat
- Search & rescue
- Mass gathering medicine
- Trauma
- Surgery
- Perioperative care
- Emergency medicine
- Anesthesiology
- Intensive care
- Burns & plastics
- And more...

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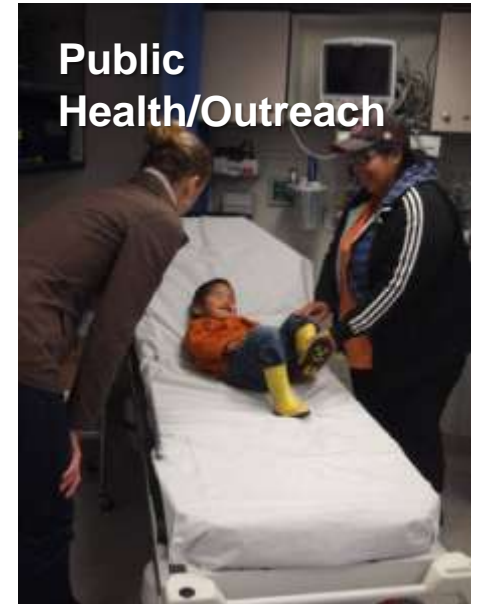
Roles of the MMU



Renovation support



Emergency Response



Public Health/Outreach



Education



Event Support

Clinical Capability - Four Levels

The MMU offers a range of clinical capability, depending on requirements:

Level 1 – Public health, outpatient clinic, & first-aid care

Level 2 – Minor ill/injured (CTAS 4-5)

Level 3 – Critical or Emergency Care (CTAS 1-5)

Level 4 – Surgical intervention/life saving emergency procedures, & CTAS 1-5



Outpatient clinic



Emergency Care



Surgical intervention

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BMX Supercross World Cup

September 12-16, 2012

Overview

- Level of care: First aid through emergency critical care (MMU Level 1-3)
- High-profile international sporting event, Abbotsford BMX Park
- Collaboration with BC Ambulance, UBC Mass Gathering Medicine Interest Group, UCI BMX



BMX Supercross World Cup

Clinical Considerations

- Past event injury statistics
 - Mechanisms of injury
 - level of care to be provided
 - Patient flow plan
- Clinical staffing model (NOT health authority based)
- Development of specialized clinical education
 - Trauma team training
- Point of care testing & diagnostic imaging
- Patient treat or transfer protocols, including site helicopter pad



BMX Supercross World Cup

Facility Considerations

- Staggered side-by-side configuration in fenced area
- Packed gravel surface
- Use of inflatable tents for minor first-aid level care
- Incorporation of BCAS Special Ops team vehicles & equipment (bicycles, gators, multiple ambulances, command unit, etc.)



Exercise Magnitude 2012

October 18-21, 2012

Overview

- Federal earthquake exercise
- Tested high level of interoperability of municipal, provincial, & federal agencies
 - including heavy urban search and rescue teams from across Canada)
- MMU positioned at HUSAR Base
- Intensive disaster medicine simulation education program delivered (two sessions at eight hrs)



Exercise Magnitude 2012

Clinical Considerations

- Interdisciplinary trauma and MCI education
- Full spectrum of MMU care (through emergency surgery)
 - Equipment & supplies required for support
- Education program design, recruitment, & administration
 - Clinical team composition
 - Integration with overall exercise
- MCI triage
- Chain of evacuation (VGH)



Exercise Magnitude 2012

Facility Considerations

- Ideal positioning within broader context of HUSAR base
- End-to-end configuration
- Use of inflatable tents for triage external to MMU
- Key learning from HUSAR:
 - Equipment, set-up, storage, transport
- Heavy rain during pack up
 - Equipment storage considerations



Surrey Memorial Hospital – Disaster Recovery

November 19-December 4, 2012

Overview

- First emergency activation of the MMU
- Severe flooding of SMH Emergency Department, leading to 10-day closure
- MMU served as part of temporary urgent care centre
 - Saw approximately 10% of total patients
- Rapid deployment of MMU
 - Official request 1300hrs
 - On-site 1900hrs
 - Set-up 2200hrs



Surrey Memorial Hospital – Flood Recovery

Clinical Considerations

- Determining equipment and supplies to pack
 - no pre-defined mission
- PACS System & other IT set-up requirements
- Patient inclusion/exclusion criteria (& on-going amendments)
- Staging and patient flow
- Just-in-time staff education
 - MMU Duty Officer at all times
- Logistics of support services
- Pediatric equipment
- Critical MMU BC Ambulance Liaison support at all stages
- Media***



Surrey Memorial Hospital – Flood Recovery

Facility Considerations

- Early contact with protection services
 - Recce visit
- Maximum parking lot grade
- Ambulance access
- Increased security requirements
- Tents for patient privacy and weather protection
- Generators for power (vs. shore power)
- IT requirements & PACS set-up
- Ongoing support and trouble shooting
 - MMU Duty Officer at all times



Pemberton Health Centre Renovation

March 21 – May 17, 2013



Overview

- Level of Care: Emergency (MMU Level 3)
- ED renovation
 - complete relocation into the MMU for 8 wks
- Longest deployment to date
- Nearly 900 patient visits
- First childbirth to take place in the MMU (5 total)
 - Rare at this particular site

Pemberton Health Centre Renovation

Clinical Considerations

- Expected injuries in the community
 - rural, agricultural, mountainous (ski, mountain bike)
 - large First Nation population
- Patient flow
- Diagnostic Accreditation Program (x-ray)
- Pediatric care & obstetrics
- Clinician education/team practice prior to care
- Governance



Pemberton Health Centre Renovation

Facility Considerations

- Weatherproofing & site safety
 - Entrance ramp canopy
 - Underbelly heating
- Shore power
- Requirement for x-ray perimeter (per diagnostic accreditation)
- Ambulance access
- Community “path disruption”
- Black-water waste disposal
- Orientation & training for on-site Facility Manager
- Renovation schedule & firm departure date



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Summary

The MMU:

- Is a publicly funded emergency management & business continuity resource for the province of BC;
- It has proven valuable as and adjunct to address gaps in trauma, emergency, and other areas of care;
- Provides clinical education each time it is deployed; and
- Has been designed with an inherent flexibility, allowing for adjustments in level of care to meet changing needs of a given mission.

Thank You!



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Supplemental Slides

Medical Equipment – Stretchers & Beds



Stryker Hospital Stretchers



Hydraulic Ambulance Stretcher



Cot (first aid level care)

Medical Equipment – Oxygen



Portable oxygen generation system – 95% O₂



Oxygen Redundancy:

- Low-flow portable oxygen concentrator
- Praxair Grab'n'Go



iVent Ventilator (2)

Medical Equipment – Suction



In-line suction



Portable suction

Medical Equipment – Adjuncts



Blanket and fluid warmer



Welch Allyn integrated diagnostics



Level 1 Rapid Infuser



Automated blood pressure



Crash cart



Digital thermometer



Sigma Spectrum IV Pumps



Medication fridge

Medical Equipment – Point of Care Lab Testing



iSTAT
Lytes
Creat
ABG's
Troponin
Lactate



HemaCue
Hgb monitor

Accu Chek
Blood glucose monitor



Bayer Contour
Blood glucose monitor



Roche Coagulocheck
INR

Others
Urinalysis
Pregnancy testing kits

Medical Equipment – Diagnostics



GE Portable Ultrasound



GE Portable X-ray



CR Reader

Monitors



Four GE Dash 5000 monitors with Central Monitor station within the primary patient care area



Zoll X-series Portable Monitor and Defibrillator

Waste Management



Vernacare system

For disposal of Vernacare products **only**

Medical waste

Please use the receptacles provided, as appropriate.

General waste & Recycling

The MMU strives to be as green as possible. There are multiple garbage and recycling bins located around the entire site. Please recycling where possible.